Dental

Abstracts

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Dental Abstracts

A selection of world dental literature

Lon W. Morrey, D.D.S., editor
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SECTIONS

Anesthesia and analgesia *page* 23
Biochemistry *page* 14
Extractions *page* 19
General *page* 55
Histology *page* 27
Operative dentistry **page 13**
Oral surgery *page* 7
Orthodontics *page* 10
Pathology *page* 33
Periodontics *page* 15
Physiology *page* 30
Prosthetic dentistry *page* 20
Public health dentistry *page* 45
Roentgenology *page* 3
Therapeutics *page* 53
New equipment *page* 60
Doctoral and Masters' dissertations *page* 61

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Roentgenology

Projection of angles and line sections in teleroentgenography: description of the Groningen cephalostat

J. M. Beek and F. P. G. M. van der Linden. *Tschr.tandheelk.* 65:565-577 Aug.-Sept. 1958

Teleroentgenography and a specially constructed cephalometer, called the Groningen cephalostat (designed by K. G. Bijlstra, the head of the orthodontic department), are used exclusively for obtaining the measurement of patients' heads prior to orthodontic diagnosis and treatment planning at the Dental College of the University of Groningen, The Netherlands.

The Groningen cephalostat is fixed to one of the walls of the examination room. It can be moved in a vertical direction just as an x-ray unit. By means of two ear posts which are inserted in the external auditory canals, the patient's head remains in the desired position. The central roentgen ray is directed exactly toward the inner tip of the ear post.

A Potter-Bucky diaphragm—preventing secondary rays from reaching the plate and thereby securing superior contrast effects and easier interpretation—is attached behind the fixation plate against which the film and an intensifying screen are positioned. To secure parallelism of the rays, the x-ray tube generally is placed at a distance of 375 cm. from the patient's head.

When the head is positioned as close to the film as possible, the linear distortion is kept at a minimum. Such procedures, however, sacrifice some of the fixed distortions which usually are associated with maintaining a constant distance in midsagittal plane films. The permanent long distance at which the teleroentgenograms are taken permits greater accuracy than the generally used distance of about 150 cm. In most instances, the teleroentgenograms are taken at 76 kv., 200 ma. and an exposure time of 1.2 seconds. A lead screen safeguards operator and patient.

The main purpose of the study was to learn the preferable projection distance.

When interpreting teleroentgenograms, the orthodontists must keep in mind that any roentgenogram is a two-dimensional projection of a three-dimensional object or a plane that is parallel to the midsagittal plane. Teleroentgenograms of the profile, therefore, do not visualize line sections which are not parallel to the film.

The projection of an angle in teleroentgenograms can be represented at the original size only if the angular plane lies parallel to the projection plane. This is of importance in orthodontic cephalometry because only those angles which are situated in the midsagittal plane can be considered for exact comparison and interpretation. Data obtained in teleroentgenographic studies in which identical distances of projection are not used cannot be evaluated or compared without strong criticism.

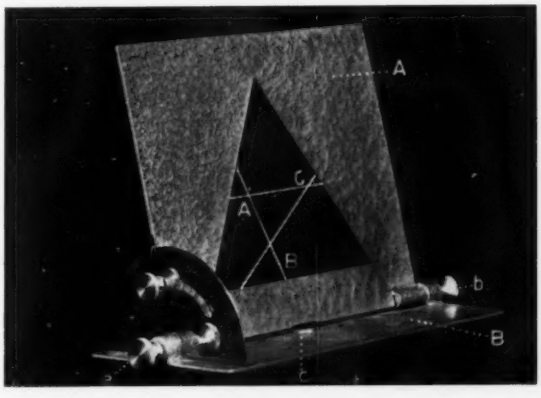
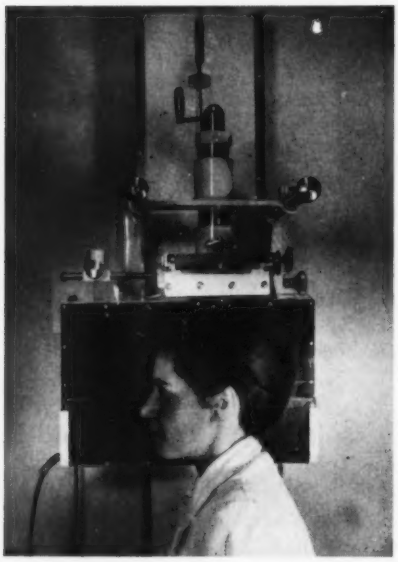


Figure 1 Device for comparison of long and short distance roentgenograms. A = movable plate in an almost vertical position. B = fixed horizontal plate. A-B-C = points to compare angles and line sections. a and b = screws permitting vertical rotation. c = screw permitting horizontal rotation



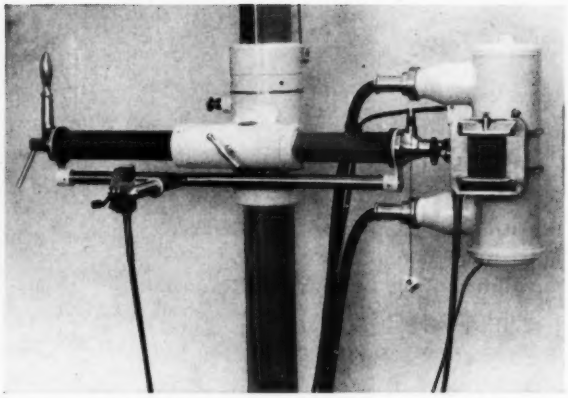
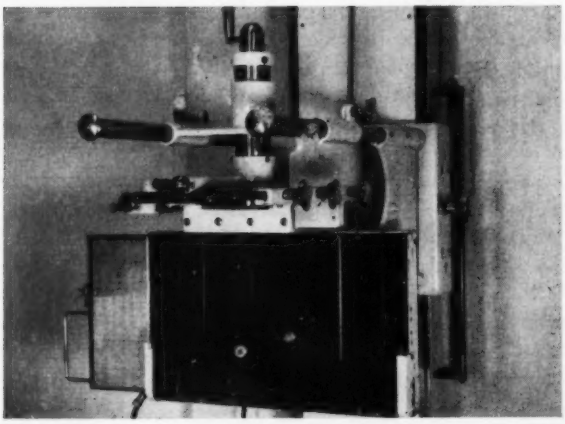


Figure 2 (Above) Cephalostat and x-ray machine, both movable. (Left) Position of the patient's head in the Groningen cephalostat



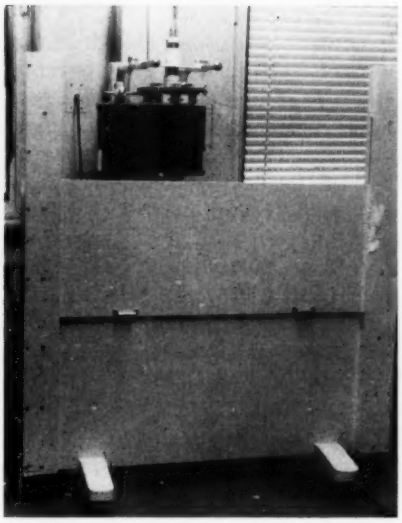


Figure 3 (Above) Combination unit ready for use. (Right) Lead screen to be positioned between patient and x-ray machine

To obtain an idea of the practicability of the Groningen cephalostat, a series of teleroentgenograms was taken. Disk A (Fig. 1) was photographed in eight different positions obtained by vertical rotation around points a and b, and horizontal rotation around point c. In each position, teleroentgenograms were taken at distances of 150 cm. and 375 cm. Comparison of the data obtained and their usefulness of orthodontic diagnoses proved that the longer distance is preferable.

The following conclusions were reached:

1. Because the exact size of the angles which do not lie parallel to the projection plane cannot be determined accurately by interpretation of a single teleroentgenogram, it is necessary to attempt a projection which approximates the perpendicular image at the highest degree of accu-

racy. In the interpretation of teleroentgenograms and comparison of tracings—both extremely important for orthodontic diagnosis and treatment planning—the long-distance projection, which approximates as nearly as possible the infinite projection, obtains results far superior to those achieved with other roentgenographic technics.

2. In teleroentgenographic studies of cranial growth and development, only the angles situated at the midsagittal plane can be used for accurate representation and evaluation.

3. Projection at a distance of 375 cm. is almost equivalent to projection from infinity, because the part of the skull important to orthodontics is exposed to roentgen rays which are fairly parallel. At a 150 cm. distance, the area is greatly decreased.

4. Projection from infinity—the roentgen rays being parallel—is to be preferred in orthodontics to projection from a comparatively short distance —the roentgen rays not being parallel—because short-distance roentgenography always causes additional distortions.

Afdeling Orthodontie, Rijks-Universiteit, Groningen, The Netherlands

Cineradiography

G. Lindblom. *Internat.D.J.* 8:396-398 June 1958

Roentgenographic recording of an object may represent either a static or a dynamic reproduction of the structure. The former procedure is represented by standard single pictures; the latter presupposes serial pictures showing different stages of the motion in question. If the serial pictures are taken with an exposure frequency fast enough to be projected as a motion picture, the procedure is called cineroentgenography. Serial recording can be performed either by direct roentgenography (cassette changing devices, roll film, magazines and so forth) or indirectly by photographing a fluorescent screen on which the moving object is reproduced by roentgen radiation. This latter procedure is called cinefluorography.

Within the dental field, cineroentgenography has been used in the study of the chewing process, the suckling process, the behavior of artificial dentures during function, and the temporomandibular articulation. Lindblom (1951) presumably is the first who succeeded in taking direct roentgen film pictures of the temporomandibular joint during physiologic movements with the patient in a sitting position.

In 1954 an opportunity was offered to the writer to make new roentgen film recordings of the temporomandibular joint when the Philips company put at the disposal of the Wenner-Gren Research Laboratory the first electronic image intensification apparatus for cineroentgenography used outside The Netherlands.

The technic for the lateral projection of the joint (Lindblom, 1936) was used, with an angulation for the central ray of 15 degrees posteroanteriorly and 15 degrees superoinferiorly.

In 1954 a special angulation outfit was constructed. Efforts were concentrated on registering the lateral condylar movements of the mandible (the so-called Bennett movement). A skull-base projection permits the patient to sit in the same upright position as for the registration of the sagittal movement of the condyle. The tube is directed inferosuperiorly through the angle of the mandible and through the zygomatic arch against the film plane above the vertex of the skull.

Valuable information can be attained by cineroentgenography. The technical procedures in this field are developing rapidly. Cineroentgenography will become still more important for dentistry in the near future.

Sturegatan 32, Stockholm, Sweden

Roentgen diagnosis of sex based on adult skull characteristics: comparison study of cephalometry of male and female skulls filmed in frontal projection

Jorge L. Ceballos and E. H. Rentschler. *Radiology* 70:55-61 Jan. 1958

A study comparing skull roentgenograms of men and women was carried out at the section of therapeutic radiology of the University of Texas Medical Branch, Galveston, Texas.

Cephalometric comparison of normal skulls of 100 men with normal skulls of 100 women was made by recording the difference in the sagittal diameter, mastoid length, mandibular width at

the level of the mastoid tips and the width of the mandibular angle.

Evaluation of the data obtained in both groups revealed that characteristic differences exist in the dimensions of skulls of men and those of skulls of women.

By cephalometric examination of a roentgenogram of the skull, the subject's sex can be determined in 88 per cent of instances if the sex characteristics in the roentgenograms are not overshadowed by hereditary or acquired deformities.

University of Texas Medical Branch, Galveston, Texas

Irradiation osteonecrosis and its treatment

Friedrich Schröder.
Fortschr.Kief.Ges.Chir. 4:438-441 1958

An extensive survey of the roentgenologic literature and subsequent experimental and clinical reports revealed that the effects of the different types of irradiation on the oral tissues have not been investigated thoroughly.

Irradiation osteonecrosis predominantly affects the lower jaw, probably because the relatively poor vascularity of its cortex renders the lower jaw far more susceptible to the deleterious effects of irradiation than the upper jaw.

Irradiation osteonecrosis of the lower jaw usually starts with the teeth becoming loose and sensitive to percussion, so that patients are unable to masticate. The patient suffers severe pain, muscular trismus and numbness of the lips. There may be swelling of the face, associated with lymphadenitis, leading to general and local complications. The condition may progress rapidly, occasionally with a fatal termination.

Children should receive conservative treatment whenever possible, to prevent loss of deciduous teeth, lesions of the tooth germs of the permanent dentition and maldevelopment of the jaws.

In adult patients, however, the necrotic bone should be removed surgically but sequestrectomy should be delayed until the suppuration has subsided completely and the sequestrum is separated. Defects resulting from sequestrectomy can be repaired by bone grafts, but from three to five years should elapse before plastic surgery is attempted.

Defects of the osseous or soft structures of the lower jaws which have been caused by repeated exposure to irradiation during treatment of acute or recurrent malignant tumors are, as a rule, beyond repair because the patient generally is in too poor a condition and metastases usually have occurred.

Nordwestdeutsche Kieferklinik, Hamburg 22, Germany

Roentgenographic opacification of pathologic formations in the mouth deprived of natural contrasts

V. Pettinari, M. Baccaglini
and G. C. Castiglioni. *J.radiol.électrolog.,Paris* 39:117-123 March-June 1958

Experiments to study the effect of contrast mediums injected into pathologic formations in the oral cavity were carried out at the Institute of Surgical Pathology of the University of Padua, Italy.

The technic used consisted of an exploratory puncture with a thin needle inserted into the abnormal formations, whether they were deep or superficial. If the needle did not damage a vascular lumen, the pathologic fluid was aspirated and a radiopaque water-soluble fluid was injected with the connected syringe.

The quantity of the contrast substance to be injected varies with the extent of the lesion to be studied and the ease of the injection. In most instances a comparatively small amount (from 1 to 3 cc.) will suffice.

Serial roentgenograms are taken at intervals ranging from 30 seconds to 1, 2, 5, 8, 10 and 20 minutes.

With this technic, the study of concealed pathologic formations in the oral cavity is possible as well as the analysis of the distribution and absorption of the injected radiopaque substance. Other anatomic information thereby is obtainable, relating to the actual form of the oral cavity, its dimensions, its internal structures, the vascular and lymphatic drainage and the intactness and permeability of the capsules containing oral cysts or tumors.

Institute of Surgical Pathology, University of Padua, Italy

Oral surgery

Cleft palate feeding aid

A. C. Roberts. *D.Technician* 11:58-59
June 1958

The difficulty of feeding babies with congenital cleft palate and cleft lip prompted the author to construct a feeding appliance which closes off the oral cavity from the nasal cavity during feeding.

The appliance consists of a superstructure in the form of a brass band fitting around the neck of a standard feeding bottle and held in place by a screw. A wing nut on the top of the brass band is used to retain the metal arm carrying the obturator feeding aid. The wing nut fits a 6 BA screw soldered to the top of the band (Fig. 1).

An impression is obtained of the child's mouth. The impression is cast and the cleft filled with plaster, a single thickness of wax is adapted, and the vault of the palate on the appliance is contoured to accommodate the bottle nipple.

A 3 mm. stainless steel rod is bent and contoured to the angle required. A flat plate is drilled to accommodate the 6 BA screw and soldered to the end of the steel rod to form the retention point. This plate fits over the 6 BA screw on the top of the band and is held in place by the wing nut. The free end of the arm is incorporated in the maxillary area of the waxed-up obturator at a point not likely to distend the lip. If the child has a cleft lip, the rod may enter via the cleft and can be readapted in a new position when the cleft lip has been repaired. The waxed-up obturator with arm incorporated is flasked and finished in the normal way. The component parts are assembled and the feeding aid is ready for use (Fig. 2).

Dental School, University of Leeds, Leeds, England

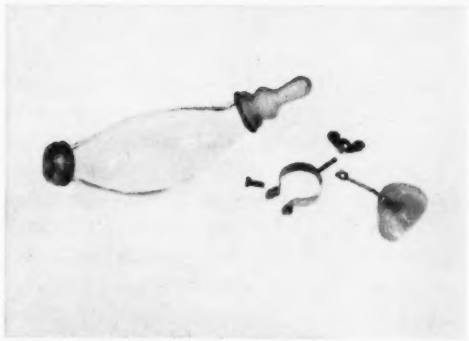


Figure 1 Parts of the feeding aid

Figure 2 Feeding aid in use

Comparative study of the methods of surgical treatment of jaw cysts

A. M. Pimenova. *Stomat.,Moscow* 36:1-37-40 Jan.-Feb. 1957

From 1930 to 1953, 2,468 operations for cysts of the jaw were performed at the Medical-Stomatological Institute in Moscow. During the first 15 years of this period complete enucleation of the cyst (cystectomy) was performed in 85 per cent of patients. During the latter part of the period, incision into the cyst (Partsch's operation) was the method of choice, and was performed in 68.5 per cent of patients.

After cystectomy, however, it was often necessary to extract healthy teeth or to perform pulpectomy. In cystectomy the danger of penetrating the maxillary or nasal cavities is increased. Partsch's operation is a simpler procedure; it is less traumatic and far more suitable for the conditions existing in most outpatient departments.

Medghis, Petrovka 12, Moscow, U.S.S.R.

Treatment of oral cancer by a combination of roentgenotherapy and radical surgery

G. Bonse. *Fortschr.Röntgenstr.Nuklearmed.* 82:93-95 July 1958

An extensive series of patients with oral cancer were examined and treated at the Cancer Clinic of the University of Würzburg from 1939 to 1955. This series included malignant lesions of the lips and the oral cavity back to and including those of the anterior pillars of the fauces and the base of the tongue.

There were 1,128 malignant tumors of the lips, 342 malignant tumors of the tongue, and 497 malignant tumors arising in other regions of the oral cavity.

The average age of the patients was 63 years. It appears that oral cancer predominantly occurs in men; 98 per cent of all instances of tumors of the lips and 80 per cent of tumors of intraoral lesions occurred in men. The lower lip is far oftener affected than the upper lip.

Oral cancer tends to be a localized disease which may spread to the lymph nodes of the neck or which may involve osseous tissues of other regions either by direct extension or associated infection. Autopsy examinations revealed that although remote metastases were found occasionally, they are comparatively rare.

All patients were examined by a team comprised of an oral surgeon, a dentist and a roentgenologist. Diagnosis was confirmed by biopsy, and the specific treatment was planned. The treatment of primary lesions was considered to be a roentgenologic problem with the following exceptions:

1. In instances in which the primary lesion occurred at the ridge of the lower jaw, involving osseous tissue, radical surgical enucleation and partial resection of the jaw was the method of choice.

2. In instances in which a primary lesion failed to respond to roentgenotherapy, leaving residual carcinoma or chronic ulceration, the primary tumor was excised. If necessary, reconstruction by plastic surgery was performed postoperatively.

In only 13 per cent of the patients with malignant tumors of the lips were the lymph nodes involved, whereas in patients with malignant tumors of the tongue or of other intraoral regions, the involvement of the lymph nodes was almost 60 per cent.

Preventive dissection seems to be justified in instances of cancer of the tongue or of the intraoral regions, especially if the patients belong to a younger age group.

After a patient had been examined by the team, and there was evidence of lymph node invasion, plans were made for immediate neck dissection and efforts were made to prevent further spread by tooth extractions or other procedures. The primary tumor then was treated roentgenologically prior to neck dissection. Occasionally, if the lymph node involvement was extensive, neck dissection was performed prior to roentgenotherapy.

All available technics of irradiation were used —extraoral and intraoral roentgenotherapy, radium needles of varying length and intensity, radium molds and radon pearls.

Careful treatment planning is needed to obtain the optimal dose which is lethal to the tumorous cells but avoids damage to the surrounding tissues. To achieve this goal, a combination of

roentgenotherapy and some forms of radium (or radioactivity) applications is frequently indicated.

Although involvement of the lymph nodes tends to be more or less localized in elderly patients, dissection should be complete, that is, it should include removal of the submaxillary glands, sternomastoid muscles and the jugular veins. When necessary, the other side of the neck may be dissected three or four weeks after the first operation.

When bone removal is indicated—subsequent to the effects of roentgenotherapy or metastases—the involved part of the lower jaw is removed by dissection of the submaxillary triangle or block dissection.

Practically all patients with advanced oral tumors received roentgenotherapy as a palliative measure.

In carcinoma of the lips, the net five-year survival was 85.1 per cent; the gross survival rate, 58.4 per cent.

In carcinoma of the tongue, the net five-year survival rate was 40.1 per cent; the gross survival rate, 33.6 per cent.

In carcinoma of other oral regions, the net five-year survival rate was 37.6 per cent; the gross survival rate, 31.8 per cent.

Cancer Institute, University of Würzburg, Germany

Permanent elimination of pain in trigeminal neuralgia

Fritz Heppner. *Zbl.Chir.* 83:511-515 Sept. 1, 1958

Elimination of intractable pain associated with trigeminal neuralgia by peripheral nerve resection is the method of choice at the surgical department of the University of Graz, Austria.

In general, severing of the peripheral nerves is not a satisfactory procedure because most of the peripheral nerves of the maxillofacial region are mixed and, therefore, their surgical interruption causes motor and trophic disturbances. In certain instances, severing of the sensory nerves has obtained gratifying results.

The most successful surgical procedure in trigeminal neuralgia is the severing of the branches of the trigeminal nerve. It is possible to perform this operation without ensuing motor or trophic disturbances and without danger of the so-called anesthesia dolorosa. Ten of 11 operations, performed by the author, were completely and permanently successful.

In trigeminal neuralgia intracranial surgery is not always indicated. Resection of the supraorbital nerve, including the supratrochlear nerve, and exeresis of the infraorbital nerves are recommended.

Anterolateral chordotomy makes it possible to eliminate sensibility to pain and temperature, permitting the preservation of motility and the sense of touch. This method is especially indicated if excruciating pain is present, especially that caused by carcinomas and their metastases. Either the third and the fourth or the fifth and the sixth cervical segments on the contralateral side of the pain should be severed. If bilateral chordotomy is indicated, surgery should be performed on different operative levels to preserve the blood supply to the spinal cord. After bilateral chordotomy, disturbances of micturition occur frequently; these are usually transitory and the passage of urine becomes normal within a few weeks.

The depth of chordotomy depends on the location and intensity of the pain. The sensory nerves enter the spinal cord in such a way that the caudal fibers from the lowest sacral segment run into the most superficial layer of the spinothalamic tract. The more cranially the lesion causing paroxysmal pain is located, the deeper are the involved layers situated into which the fibers run into the tract (Auerbach-Flatau's law). Therefore, to eliminate pain located in the deeper regions of the maxillofacial region, a superficial incision is often sufficient; in intractable pain caused by carcinomatous metastases, however, the incision has to be extremely deep.

Surgical Clinic of the University of Graz, Austria

Orthodontics

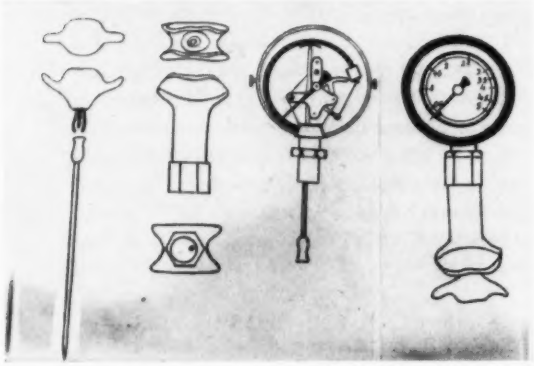
Muscular forces of the tongue: the influence of tongue movements on the development of dental arches, jaws and palate

Bella Kunváry. *Schweiz.Mschr.Zahnhk.* 68:212-220 March 1958

The muscular forces of the tongue, which unquestionably play an important role in the formation of the dental arches, the jaws and the palate, and thereby in development of malocclusion (especially Angle's Class II, Division 1), were measured and investigated at the orthodontic department of the Dental School of the University of Budapest, Hungary.

A specially constructed, comparatively simple, device was used to measure and record the strength of the muscular forces of the tongue in patients with and without malocclusion. The apparatus consisted of an aneroid barometer to determine pressure, a holder for paper disks and an elongated acrylic tube which registered the strength of the bite as well as the force exerted lingually. Patients are encouraged to bite the acrylic tube and to push with the tongue against it.

Figure 1 Apparatus for measuring the muscular force of the tongue. From left to right: Aneroid spring, elongated holder for paper disks, elongated acrylic tube, and the apparatus assembled



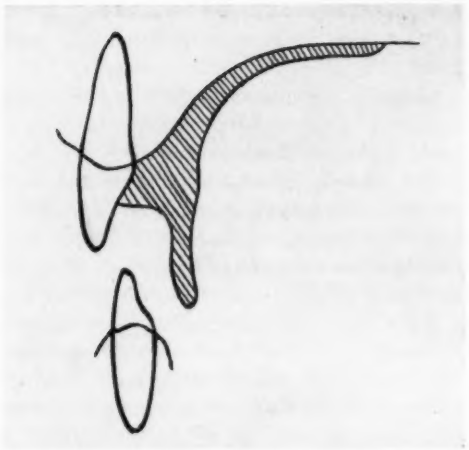


Figure 2 Device to obstruct tongue movements

Although the values recorded cannot be considered as absolute figures, they do permit a comparison between the lingual forces exerted by patients with malocclusion and those with normal occlusion.

The lingual force in men registers from 8 to 10 pounds, that in women from 6 to 8 pounds. In children, however, the figures vary greatly. In normal children, the tongue exerts a pushing force of from 2 to 5 pounds, but occasionally forces of from 8 to 14 pounds were registered. The strength of the lingual forces is not necessarily dependent on the size of the tongue. Patients with macroglossia, for instance, exert a lingual force not stronger than that in normal persons, and the muscular force of tongues of normal size sometimes exerts pushing powers of a high quality.

Prior to orthodontic treatment of children, five recordings of tongue pressure are made at one sitting. During the measuring, the children are told to count slowly which permits determining how often the tongue pushes against the acrylic tube in one hour. The obtaining of this figure aids in treatment designed to eliminate the habit of tongue thrusting. The average number of times the tongue pushes, 100 in one hour, is surprisingly high.

From the data obtained the arithmetic figures

Figure 3 Condition of the dentition before (left) and after (right) breaking the habits of thumb-sucking and tongue thrusting

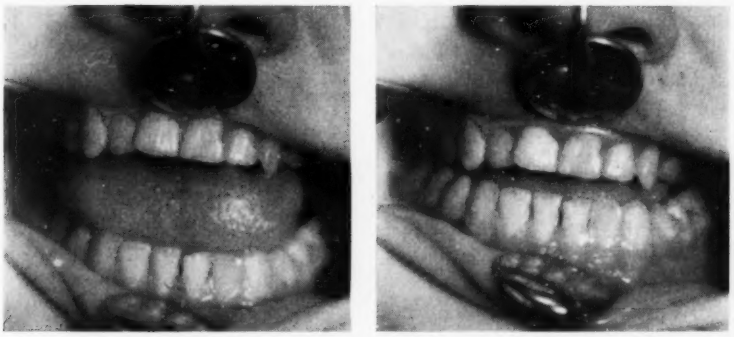


Figure 4 Left: Macroglossia causing prognathism and open bite. Right: Condition of same patient after tonsillectomy and orthodontic treatment

(average and deviations) and the possible errors in calculation were determined.

Previously, all orthodontic treatments were based on the supposition that the lingual and labial muscular pressures were comparatively weak. The forces exerted by the tongue on the dental arches, the jaws and the palate, however, are far stronger than expected. In several children, the pushing force of the tongue exceeds 1,000 pounds per day.

Management of unfavorable habits such as thumb-sucking, tongue thrusting and nail biting usually can be achieved by persuading and explaining. If this fails, a passive acrylic plate is inserted to serve as an obstacle to excessive tongue movements.

In individual instances, the role that tongue movements plays in the development of irregularities in occlusion is determined with a gnathodynamometer. In children in whom there is an incongruity between the size of the tongue and circumference of the oral cavity, tonsillectomy usually brings relief. Experience has proved that surgical removal of the tonsils makes it easier to break the unfavorable habits.

To use the muscular forces of the tongue positively, the children were taught to push the tongue against occluded isolated teeth through the bite barrier. By utilizing tongue pushing in this way it was possible to raise tilted lower bicuspids.

Mechanical orthodontic appliances cannot eliminate the causes of malocclusion. To remove these causes—if they are not inherited—the orthodontist needs the full cooperation of the child. To be successful, the orthodontist should not be satisfied merely to prevent and correct irregularities of the teeth and jaws; he should use the movements of the tongue as an orthodontic procedure to be regulated by training of the muscular forces of the tongue.

Beloiannis Utca 18, Budapest 5, Hungary

The age factor in orthodontics

G. G. T. Fletcher. *D.Practitioner* 9:31-40
Oct. 1958

Clinical observation has led the author to the following views:

1. Prolonged appliance therapy results not so much from the patient's failure to cooperate or from any intrinsic difficulty of the orthodontic problem, but from errors of judgment on the part of the orthodontist.

2. Orthodontic treatment of patients with adult dentitions (that is, with second bicuspids or permanent second molars erupted) frequently seems to be more effective and speedy than treatment of younger patients.

The records of 200 patients who had completed orthodontic treatment at the Eastman Dental Hospital in London were examined; 100 had adult dentitions when they commenced active orthodontic appliance treatment, and 100 had mixed dentitions.

Of the 100 patients with adult dentitions, the average age at commencement of treatment was 13 years 8 months, the average duration of appliance treatment was 1 year 8 months, and the average number of visits was 30. Of the 100 patients with mixed dentitions, the average age at commencement of treatment was 9 years 11 months, the average duration of appliance treatment was 3 years 11 months and the average number of visits was 45.

Of the 100 patients with adult dentitions, 61 were under orthodontic treatment less than 24 months; 14, less than 30 months; 9, less than 36 months, and 16, 36 months and over. Of the 100 patients with mixed dentitions, 8 were under orthodontic treatment less than 24 months; 4, less than 30 months, 11, less than 36 months, and 77, 36 months and over.

When the 200 patients were distributed by age groups, it was seen that those whose age at the beginning of treatment was between 7 and 11 years were under treatment for about four years; those commencing treatment between 11 and 13 years of age were under treatment for slightly over two years, and those beginning treatment after 14 years of age were under treatment for less than two years.

Of the 200 patients, 127 had commenced orthodontic treatment during the final change-over period from mixed to permanent dentition. Of the 127 patients in the transitional period, 60 had permanent dentitions and 67 had mixed dentitions. The 60 patients with permanent dentitions were treated for an average period of 1 year 10 months, and had 33 appointments. The 67 patients with mixed dentitions at the transitional period were treated for 3 years 9 months on the average, and had 45 appointments.

Every patient has a vital responsibility in his own orthodontic treatment. It is essential that the patient be capable of intelligent cooperation and be willing to carry out whatever may be required of him through a sincere desire to obtain a speedy, successful outcome. The older patient is more likely to seek orthodontic treatment as a result of his personal desire for correction of tooth irregularity or malocclusion. If reasonably intelligent, he will understand explanations of what is involved in the treatment.

The complete permanent dentition provides the orthodontist with firmer and more extensive anchorage against which multiple tooth movements can be carried out, and reduces the risk of inadvertent movement of the wrong teeth by reciprocal action.

Of the 100 patients with permanent teeth, 37 were treated with multiband appliances and the average duration of active treatment was 1 year 5 months. Twenty were treated partly with multiband and partly with simple fixed or removable appliances, and 43 patients were treated with simple fixed or removable appliances. The average duration of active treatment for both these latter groups was 1 year 11 months.

Treatment planning becomes surer and more objective when the complete adult dentition has been present long enough to have overcome its initial instability, and when all the factors in the final adult dental balance have exerted their respective influences on one another and the effects can be seen and judged.

The author does not mean to suggest that treatment is automatically shortened by commencing in the adult dentition, or that orthodontic treatment inevitably is prolonged if it commences in the mixed dentition.

Eastman Dental Hospital, Gray's Inn Road, London W.C.1, England

Operative dentistry

Preformed multiple matrix bands

John Tocchini. *J.California D.A. & Nevada D.Soc.* 35:22-24 Jan.-Feb. 1959

In multiple cavity preparation, the use of preformed matrix bands in conjunction with a rubber dam and high-speed handpieces produces more efficient dentistry with less fatigue to the patient and the operator.

Instruments and materials needed include the following: the lid of a Moyer copper band box; matrix material of the following dimensions: for deciduous teeth, 0.0015 by 3/16 inch, and for permanent teeth, 0.0015 by 1/4 inch; spot welder; no. 77 contouring pliers (or the equivalent), and a clear plastic compartmented box for storing the bands.

The band material is cut into sections 1½ inches long. These sections are formed into loops by adapting them around the appropriate projections of the copper band box lid (Fig. 1) and crimping them with the pliers. The loops, or bands, are spot welded in three or four places. The excess band material is cut away from the joint and the band is placed in the proper compartment of the clear plastic box (Fig. 2).

After a little experience, the correct band size can be selected quickly and fitted accurately to the tooth. All matrix bands should be wedged. A wedge is made from a trimmed, round pointed wooden toothpick, or whittled from a wooden tongue depressor. The wooden wedge is shaped triangularly and is placed above the gingiva, buccally or lingually (Fig. 3). When the wedge is fitted, care must be taken not to flatten the proximal contour of the matrix band or to injure the gingival tissue.

Preformed matrix bands have been used for many years by the author and associates to facilitate the restoration of cavities, either in individual teeth or in several teeth in a quadrant.

225 Spruce Avenue, South San Francisco, Calif.

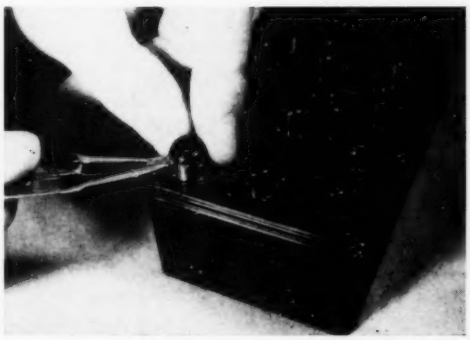


Figure 1 Sizing and crimping the band

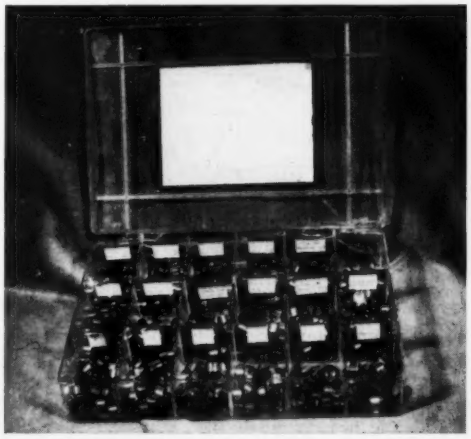


Figure 2 Clear plastic container for bands

Figure 3 Wedged bands

Biochemistry

Problems of calcification of teeth and bone

J. T. Irving. *J.D.A.South Africa* 13:295-302 Aug. 1958

In an attempt to clarify the problem of why all tissues containing collagen do not calcify, the following tissues were investigated: ox hide and Achilles tendon, rat tail tendon, ox bone and dentin, and human dentin. From the investigation there developed the concept that calcification, being a process of crystallization of apatite, a specific collagen, with charges at specific points on the amino acid chain, could form a "template" for the seeding of the crystals. The fact that the crystals are first deposited at the cross-banding, where basic and acidic amino acids are believed to be concentrated, supports this idea. Thus, for calcification to occur in a tissue, a specific type of collagen must be present and this may explain why some tissues containing collagen will calcify, whereas others do not.

Another aspect of calcification investigated was the role played by mucopolysaccharides in the mineralization of tissues. The ground substance of all connective tissues contains mucopolysaccharides; cartilage has a high content of chondroitin sulfate, but dentin and bone contain much less. There is evidence that mucopolysaccharides, and especially chondroitin sulfate, are concerned in calcification. A puzzle that has not been explained is why all cartilage, which contains chondroitin sulfate and is metachromatic, does not necessarily calcify.

Experiments indicate that a sudanophil material is associated with the initiation of calcification and that this material is probably a mucopolysaccharide, but not chondroitin sulfate. Its exact nature is unknown; experiments are under way in an attempt to identify it. The material differs in several ways from that of the soft tissues.

To reconcile these findings with the aforementioned report on collagen, the following tentative theory has been evolved: The sudanophil substance acts as a "primer" for calcification, since in its absence no calcification occurs. The specific type of collagen is needed for the seeding of the crystals and also for the apatite crystals to "stick to," forming a stable calcified structure such as dentin and bone. Once the crystal of apatite is formed, the role of the mucopolysaccharide is over and it is possibly removed. The collagen's function now is the maintenance of the structure of the mineralized material.

University of the Witwatersrand, Johannesburg, South Africa

Histochemical and biophysical studies of the hard tooth substances

Walther Müller. *Deut.Zahnärztebl.* 12:457 July 8, 1958

Histochemical and biophysical researchers of the University of Zurich, Switzerland, have developed a method which permits accurate separation of enamel, dentin and cementum layers in a 99 per cent pure condition.

This method has been used recently to determine the degree of density of the hard substances of human permanent teeth.

The density of enamel varies in individual teeth from 2.89 to 3.00 Gm. per cubic centimeter, that of dentin from 2.00 to 2.30 Gm. per cubic centimeter, and that of cementum from 2.01 to 2.05 Gm. per cubic centimeter.

Each permanent incisor examined consisted of approximately 30 per cent enamel covering the coronal portion. The enamel in other permanent teeth varied from 38.9 to 42.3 per cent.

This method will be used in future research to determine the role alkaline phosphatase plays in the calcification process within deciduous and permanent teeth. Previous research already has localized this enzyme in the odontoblastic layers and the dentin.

Römerhof, Zurich, Switzerland

Periodontics

Instrumentation in ultrasonic periodontal therapy

Sol J. Ewen and Paul J. Tascher.
J.Periodont. 30:67-71 Jan. 1959

A series of new instruments for ultrasonic use in periodontal therapy has been designed. Since the vibrating tool tip is a reciprocal action device moving in a push and pull pattern, instruments with two edges are more effective than instruments with only one edge. The new instruments resemble traditional files, curets and probes.

For gross subgingival debridement, transducer inserts using dulled Orban files (Fig. 1, a, b, c, d) and McCall curets no. 13, 14, 17 and 18 (Fig. 1, j, k, l, m) are suggested. For detailed root planing, Morse scalers no. 0 and 00 (Fig. 1, i, n, o) have proved effective. A new periodontal probe (Fig. 1, p) is 12 mm. long, and is rectangular in cross section and hollow-ground. This probe is used for planing the rounded corners of root surfaces.

These instruments are used with a constant stream of water or with selected medicaments for subgingival scaling. Since ultrasonic vibrations are sufficient to dislodge deposits, the instruments should remain dull to avoid inadvertent overplaning of root surfaces.

Previous procedures of removing marginal overhangs with rotary instruments, files, chisels and abrasive strips have been tedious and frequently traumatic to the tissues. A blunt chisel or sickel scaler (Fig. 1, e, f, g, h) has proved effective in removing marginal overhangs. The instruments are vibrated with a sweeping motion from tooth to restoration margin, under a flow of water.

Roentgenograms illustrate the recontouring of an overhang in an amalgam restoration in a maxillary right first molar (Fig. 2).

Liquids exposed to ultrasonic vibrations burst

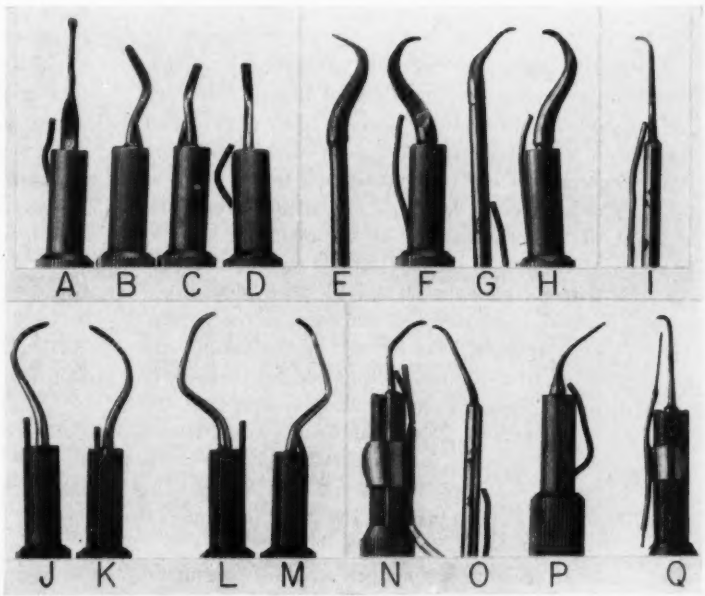


Figure 1 Dulled Orban files on inserts A, B, C, D; McCall curets J, K, L, M; Morse scalers I, N, O; periodontal probe and scaler P; instruments for contouring restorations E, F, G, H; medicament delivery tube, 28 gauge Q

Figure 2 The recontouring of an overhang on an amalgam restoration in a maxillary right first molar

into an accelerated spray that penetrates to the depth of the periodontal pocket. Bubbles also are released from the fluid; this combination of spray and bubbles is effective in flushing debris out of periodontal pockets.

Sodium hypochlorite solution, N.F. (Zonite), used in a dilution of one tablespoon to a quart of water, has been found an effective medicament for use with the ultrasonic instruments. The solution is supplied by means of a gas washing bottle and compressed air from the dental unit.

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A histological study of mucoperiosteal flap healing

Theodore H. Dedolph, Jr., and Henry B. Clark, Jr.
J.Oral Surg. 16:367-376 Sept. 1958

This study was conducted to determine whether the raising and replacing of buccal mucoperiosteal flaps from the necks of teeth would result in any permanent abnormality of the periodontal structures and their attachment to the teeth, as determined by histologic examination. The material studied consisted of 19 amputated portions of teeth and attached tissues secured from six different patients. Of the 13 block sections obtained, eight included two teeth in the section. Six specimens were taken from the maxilla and seven from the mandible. After the preliminary raising and replacing of mucoperiosteal flaps, the block sections of teeth and surrounding tissues were removed at intervals of 48 hours, one week, two weeks, three weeks and four weeks. The various sections taken at any given time interval were all remarkably similar.

At 48 hours the epithelium and free gingival fibers were separated from tooth and bone by acute inflammatory exudate and hemorrhage.

At one week the acute inflammatory exudate had been replaced by chronic inflammation covered by proliferating epithelium. The free gingival periodontal fibers were regenerating and rearranging themselves.

At three weeks the epithelial attachment was complete, the attachment of periodontal membrane fibers and other connective tissue elements was restored, and inflammatory reactions were mild or absent. The appearance was indistinguishable from that of control sections and from that of the experimental sections removed after four weeks of healing.

This study confirmed the clinical observation that mucoperiosteal flaps raised from the buccal or labial aspect of sound teeth, then replaced and sutured with reasonable care, heal promptly and become firmly reattached in about three weeks. Serial chronological histologic sections indicated that strong dynamic processes were at work during the healing period which were directed toward complete restoration of the preoperative anatomic status.

This return to virtual anatomic normalcy is even more remarkable when it is recalled that the teeth in these specimens had been condemned because of advanced dental disease. Varying degrees of gingival inflammation, with associated calculus, were present; in spite of these adverse features, healing progressed satisfactorily.

There should be no hesitation in outlining flap designs of sufficient size to provide maximum visibility, wide access, and a broad surface of bone on which the flap margin may rest for optimum healing.

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Mycologic research on "pyorrhea"

A. Mugnier. *Parodontol.,Zürich* 12:114-115 Oct. 1958

Specimens of the periodontal tissue taken from 36 patients with "schmutz pyorrhea," purulent inflammation of the alveolar periosteum associated with progressive necrosis, looseness of the teeth and the accumulation of hard calculus in the deep periodontal pockets, were examined mycologically at the Dental Clinic of the Hospital of Beaujon, France.

The investigation was directed toward the determination of the presence of *Candida albicans* in the periodontal membrane, the gingiva and the tissues surrounding the alveolar bone. Special attention was paid to the contents of the gingival pockets.

With Gram's staining method and cultures grown in special nutrient media, no evidence of *C.albicans* was found in the specimens taken from the periodontium, but in 12 instances this fungus was evident (and in abundance) in the deep pockets.

Further investigations will be carried out to establish whether *C.albicans* plays a significant role in the development of periodontal disease.

Service de Stomatologie, l'Hôpital de Beaujon, France

Studies on a bacitracin periodontal dressing

Paul N. Baer, Henry M. Goldman and John Scigliano. *Oral Surg.,Oral Med. & Oral Path.* 11:712-720 July 1958

An investigation was undertaken to try to develop a periodontal dressing which would possess antibacterial properties and would be stable at room temperatures. Predeterminations suggested that bacitracin might be useful in such dressings. Bacitracin rarely produces sensitivity; it is not inactivated in the presence of the enzymes studied to date; its activity is not inhibited by organisms which produce penicillinase; it is bactericidal and bacteriostatic; it has a wide spectrum of antibiotic activity, and its action is not inhibited by necrotic tissue, pus, exudates, secretions and blood serum.

Various experimental dressings were tested in vitro against whole saliva. It was concluded that periodontal dressings that contain no antibiotic have little or no antibacterial effect. It was further found that eugenol has some inactivating effect on bacitracin and that tannic acid inactivates bacitracin.

In a clinical investigation, experimental dressing E was used as a postsurgical dressing. The powder portion had the following formula: zinc oxide powder, 99.0 Gm.; rosin, powdered, 126.0 Gm.; absorbable gelatin sponge (Gelfoam) powder, 4.0 Gm.; zinc bacitracin powder 58.8 units per milligram, 11.68 Gm. (3,000 units of zinc bacitracin per gram of the other ingredients). The liquid portion consisted of: lump rosin, 7.5 Gm.; almond oil, sweet, 30.0 ml., and eugenol, 60.0 ml.

In the first 100 patients, the experimental dressing was used; in the next 100 consecutive patients, a control dressing which contained no antibiotic was used. All packs were left on for one week.

No allergic reactions occurred in either group. Healing appeared to be taking place at an optimal rate in both groups. In the experimental group, one patient developed a monilial infection on the buccal mucosa opposite the dressing; this area was completely healed in seven days, however. In the experimental series, no patient was aware of any unpleasant odor or taste; in the control series, 83 per cent were so aware.

A clinical impression was obtained that the teeth were less stained and that the pack was cleaner in the experimental group. To test the validity of this observation, in the next 50 consecutive patients a controlled experiment was run, as follows: After completion of the gingivectomy, a control dressing was placed over an area involving a minimum of three teeth, and the bacitracin dressing was placed over the remaining area which also contained a minimum of three teeth. At the end of one week both dressings were removed. In every instance the teeth were cleaner and less stained on the bacitracin side. In every instance the debris, both under and around the bacitracin dressing, was much less than that about the control dressing. No allergic reactions or fungus infections occurred in any patient. In an additional 50 pa-

tients, the bacitracin dressing was used alone, and all the previously mentioned findings were confirmed.

The dressing containing 3,000 units of bacitracin per gram is an effective postgingivectomy pack. It is stable at room temperature, easy to use, and affords maximum comfort.

National Institute of Dental Research, Bethesda, Md.

Treatment of recurrent gingivitis

Zahnärztl.Praxis 9:185 Aug. 15, 1958

Q.—The patient, a 77 year old man, showed an extensive destruction of the epithelium and surface of the gingiva. This is the third time acute necrotizing ulcerative gingivitis recurred after intervals of about ten years. Previously, the topical application of various dyes had obtained cure; in the latest recurrence the same method proved to be ineffective. Two months ago, the patient received an acrylic denture. What treatment method is recommended? Is it possible that the new denture plays an important role in the development of recurrent stomatitis?

A.—To answer the last question it is necessary to know whether the patient wears a partial or a complete denture. Partial dentures fixed to inadequately functioning teeth may be responsible for small gingival ulcers from which gangrenous decomposition spreads rapidly, involving all the surrounding tissues. Blood diseases, such as leukemia, may cause changes in the gingiva which simulate the symptoms of acute necrotizing ulcerative gingivitis. Proper treatment of this disease includes complicated periodontal procedures. Penicillin may be used topically or systemically (oral administration or intramuscular injection). If penicillin proves ineffective, chlortetracycline (in capsules) should be tried. At any rate, it is advisable to replace the denture by inserting an excellently fitting denture constructed of metal or another material but not of acrylic resin.

(13b) München-Gräfelfing, Germany

New treatment of periodontosis and other oral inflammations

Adolf Gaschler. *Parodontol.,Zürich* 12:105-114 Oct. 1958

Chronic inflammations of the investing and supporting tissues surrounding the teeth often are the cause of periodontosis. The chronic character, leading to degenerative disturbances of the periodontium, is a result of deficiency of proteolytic enzymes in the blood stream.

Colorimetric methods, used in the examination of the blood in a number of patients with periodontosis, revealed that there was always evidence of a low value of proteolytic enzymes. The effects of this deficiency consist mainly of an insufficient destruction of protein food particles, cellular defects and bacterial proteins. This induces not only allergic inflammatory reactions but also, because the materials are not removed, bacterial growth which promotes a rapid and irregular resorption of the alveolar bone.

Chronic periodontosis is a comparatively rare disease, and although no definite explanation of its cause has as yet been offered in textbooks, improvement and complete healing have been obtained by submucous injection of proteolytic enzymes (Holoferm G 99).

In comparatively mild instances of periodontosis and for prevention of the disease and of other oral inflammations, Holoferm G 99 can be applied locally in the form of a powder.

Holoferm G 99 contains trypsin, and its healing action takes place by activation of the natural zymogens in the blood stream.

The enzyme substitution by Holoferm G 99 injection or topical application can be used also in the treatment of root canals and dental focal infections.

After the missing enzymes are replaced in the blood stream, not only does the desired reaction occur locally, but a general systemic effect is obtained which opens new ways for dental and medical treatment planning.

München-Solin, Germany

Extractions

Impacted lower third molar as the cause of severe headaches: report of case

G. Debernardi. *Minerva stomat.* 7:337-345 July 1958

Although impacted lower molars occur comparatively often, only a limited amount of information is to be found in dental and medical literature which would indicate that such a condition may cause severe headaches.

The patient, a 23 year old man, appeared for periodic dental examination at the clinic of the Dental School of the University of Turin, Italy. He had a history of severe headache attacks extending over more than six months. Lancinating pain began in the anterior section of the right temporal region and spread posteriorly toward the occiput. Although the headaches were fairly constant, they increased in intensity every third day.

Prior to dental examination, the patient had been examined by a number of physicians but they were unable to find the cause of or to relieve the headaches. A consultation with a neurologist ruled out the possibility of a brain tumor.

Examination of the region of the lower right third molar revealed the presence of a deep pocket between the horizontally impacted third molar and the distal surface of the second molar.

Chronic infection in the pocket required immediate surgical removal of the impacted molar.

After successful extraction, by sectioning, and an uneventful healing period, the headaches disappeared spontaneously. Obviously, this was an instance of referred pain, the site of stimulation being the inferior alveolar section of the mandibular division of the trigeminal nerve, and the site of referred sensation being the region supplied by the auriculotemporal branch of the mandibular division of the trigeminal nerve.

Clinica Odontoiatrica dell'Universita di Torino, Corso Polonia 2, Turin, Italy

Comparative effects of local and systemic antibiotic therapy in the prevention of postextraction bacteremia

I. B. Bender, R. S. Pressman and Sylvia G. Tashman. *J.A.D.A.* 57:54-66 July 1958

Methods of preventing the bacteremia which follows tooth extraction were investigated in 357 patients divided into one control group and eight experimental groups. Eight different types of preoperative antibiotic therapy were compared: penicillin; streptomycin; penicillin-streptomycin mixture; chloramphenicol, administered intravenously; two kinds of antibiotic troches for local administration, and two combinations of parenteral antibiotics with troches. Studies included blood cultures, bacterial population counts in the saliva, identification and frequency counts of isolated organisms, in vitro sensitivity tests or organisms, and assays of antibiotic levels in blood serum and saliva. The incidence of bacteremia immediately after extraction and ten minutes after extraction was evaluated. The following conclusions were drawn:

1. The hypothesis that the organisms in postextraction bacteremias are the normal inhabitants of the mouth which gain entrance to the blood stream through the traumatized gingival sulcus was confirmed.

2. The incidence of bacteremia can be reduced by minimizing the operative trauma.

3. The incidence of bacteremia can be reduced by increasing the concentration of antibiotics in the saliva.

4. The administration of a single antibiotic is of only limited effectiveness.

5. The most effective treatment was a combination of systemic and local therapy as follows: an intramuscular injection of a penicillin-streptomycin mixture one hour before tooth extraction plus an antibiotic troche, to be slowly dissolved in the mouth, taken one-half hour before extraction. The troche contains penicillin, bacitracin, sulfadiazine and benzocaine. A slightly less effective troche, for use with penicillin-sensitive patients, contains neomycin, bacitracin and polymyxin.

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Prosthetic dentistry

Pinless gold inlays to repair fractured corners of incisors: Class IV cavity preparation

J. G. de Boer. *Zahnärztl.Welt & Reform* 59:377-378 July 25, 1958

A modification of the customary incisal step technic in Class IV cavity preparation is used at the department of operative dentistry ("Sosiodontics") of the University of Groningen, The Netherlands. The technic permits the insertion of pinless gold inlays into fractured or severely carious incisors, even when they appear to be extremely thin labiolingually.

The required size and the desired position of the pinless gold inlay are determined after study of serial roentgenograms and casts made from alginate impressions.

One of the prerequisites for successful insertion of this inlay type is that it must be positioned in such a manner that it neither encroaches on the pulp nor weakens the proximal enamel. Less gold is displayed and more tooth structure is preserved if this technic is used instead of other methods.

The cavity is prepared in the usual manner but it must permit free withdrawal linguoincisally. The proximal portion should be prepared first by cutting the labial wall parallel to the long axis of the tooth. The lingual wall is prepared with a slight lingual inclination in line with the direction of withdrawal.

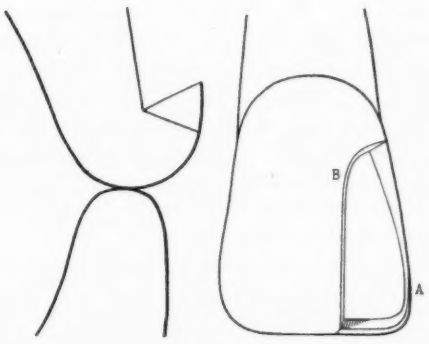
The dovetail should be of adequate size and depth to retain the pinless inlay. After being modeled in wax, the dovetail is cut parallel to the enamel rod cleavage line. The indicated gingival seat of the inlay is rather flat, at a right angle to the long axis, and the gingival margin is accurately beveled.

The most favorable esthetic result is obtained if a minimum of gold is displayed after insertion. This can be achieved best if no undercut is made in the incisal wall and the pulpal seat is prepared as a flat, resistant surface of a uniform depth. Pinless gold inlays require walls that are either perpendicular to the pulpal seat or slightly divergent from that seat in a defined angle.

The finishing of the line angles and of the lateral walls of the incisal step may be accomplished with small hoes or chisels used in a scraping motion.

The impression must reproduce the minutest details of the cavity preparation so that the pinless gold inlay can be placed properly in the die.

Prior to treatment planning, however, the following factors should be considered: (1) the age and the physical condition of the patient; (2) the



Left: The incisal wall of a Class IV cavity preparation ready to receive the pinless gold inlay. No undercuts. Right: The lateral wall (B) of a Class IV cavity preparation diverges incisally from the pulpal seat (A) at a well-defined angle

ability and willingness of the patient to cooperate; (3) the condition of the tooth supporting structures; (4) the development of the root; (5) the amount of destruction caused by caries or fracture; (6) the rapidity of the carious process; (7) the location of the cavity and the degree of access obtainable; (8) the esthetic requirements; (9) the type of restorations previously inserted in the patient's mouth, and (10) the required value and longevity of the restoration.

Polikliniek en Laboratorium voor Sosiodontie, Rijks-Universiteit Groningen, The Netherlands

Pressureless bite recording with occlusal equilibration of complete dentures

Ejnar Gade. *Tandlaegebl.* 62:182-186 March 1958

When Thiokol is used instead of wax for bite registration, dentures can be mounted in the articulator in such a way that the final spot grinding and milling can be done quickly and accurately.

Initial equilibration in the mouth is recommended. This helps the patient to close gently with the jaws in centric relation when the mixed Thiokol is placed on the dry surfaces of the molars and bicuspids of the lower denture. A quick-setting material is preferable. Before the denture is remounted, some sticky wax must be used as a support to prevent any compression of the Thiokol bite.

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The casting shrinkage of cobalt-chromium alloys

R. Earnshaw. *Australian D.J.* 3:159-170 June 1958

Although the cobalt-chromium alloys were introduced into dentistry in 1929 and have come into wide use as alternative materials to the gold-based alloys for partial denture castings, little work appears to have been carried out on the accuracy of the casting processes associated with the cobalt-chromium alloys. In the course of an investigation into the dimensional accuracy of cobalt-chromium alloy castings, it was considered desirable to make quantitative measurements of the actual casting shrinkage of the five alloys available in Britain. The actual casting shrinkage is defined as the contraction of the alloy which occurs when a casting is made.

As a starting point, it was decided to determine the actual casting shrinkage of the five cobalt-chromium alloys by a direct method, using a mold which produced castings of the same ratio of surface area to volume as that used by Coleman (1928) in his investigation of the actual casting shrinkage of coin gold, so that a valid comparison of results could be made. Both torch and induction melting were used; the method of melting the alloy did not affect the results.

As a group, the five alloys tested showed an actual casting shrinkage of about 2.2 per cent when measurements were made on cast specimens 0.125 inch in diameter by about 2.5 inches in length. This casting shrinkage requires a mold expansion of 2.25 per cent for accurate compensation. Coleman found that the actual casting shrinkage of coin gold was 1.25 per cent. Hollenback and Skinner (1946) obtained values of 1.67 per cent for the shrinkage of pure gold and 1.50 per cent for that of a 22-carat gold alloy.

Both the shape of the casting and the strength of the investment are factors which affect the actual casting shrinkage.

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Post-damming the full metal palate

Roy Storer. *D.Practitioner* 9:20-21 Sept. 1958

The retention of a maxillary complete denture is enhanced if a peripheral seal is obtained between the periphery of the denture and the tissues at the mucosal reflection.

The circle of seal must be completed by the provision of an accurately positioned post-dam. A major cause of poor retention in the upper denture is the placing of a post-dam too far anteriorly. For the post-dam to be effective it must be placed on soft, compressible, nonvibrating tissue just back of the junction of the hard and soft palates. The correct position and degree of compression necessary can be determined only by a combined visual and digital examination. A procedure utiliz-

ing an adjustable acrylic post-dam has been utilized successfully by the author for the past two years in all instances where a complete upper metal base has been used.

After a sodium bicarbonate rinse and prior to the taking of the major impression, the palate is dried with a napkin and examined visually and digitally for the correct post-dam position. A line is drawn on the mucosa with a fine indelible pencil across the palate from one pterygomaxillary process to the other. The impression is taken and on withdrawal the line will be transferred to the impression surface. This line is accentuated so that in turn it will be transferred to the master model.

The technician now has the post-dam position indicated provisionally, and he constructs the metal base. In the laying down of wax, the posterior quarter inch of the palate is formed as a meshwork. Wax biterims are added to the metal base and the posterior meshwork covered with wax. The work is then taken through the normal bite registration to the try-in stage. The final anteroposterior position and vertical depth of the post-dam now is determined and cut on the master model. The denture is processed and the original wax post-dam now is formed in acrylic resin.

By this technic an accurately positioned post-dam can be obtained and, if necessary, modified by additions or reductions to the acrylic resin.

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The nature and behavior of denture cleansers

David H. Anthony and Paul Gibbons.
J.Pros.Den. 8:796-810 Sept.-Oct. 1958

This study was undertaken in an attempt to evaluate the popular methods of cleaning dentures and to develop, if possible, a simple means of cleaning dentures with materials readily available to the patient.

A questionnaire sent to patients of the denture department of the University of Michigan School of Dentistry requested information regarding the type of cleanser employed, the method and frequency of use, the degree of satisfaction, and suggestions for improvement. The effects of household cleansers and commercial denture cleansers on dentures also were studied.

Only 41 per cent of the 120 denture patients responding to the questionnaire use the commercial denture cleansers. The remainder employ either dentifrices or home cleansers, such as vinegar, hypochlorite, soda, salt, soap, abrasive cleansers or Listerine. Seventy-four per cent of the respondents said they both soaked and brushed their dentures; 20 per cent brushed only, 5 per cent soaked only, and 1 per cent sponged their dentures. Forty-three per cent of the respondents said they cleaned their dentures two or three times daily, and 36 per cent said they cleaned their dentures once daily.

More efficient stain removal was the most frequently mentioned suggestion for an improved denture cleanser.

The commercial denture cleansers studied were Vince, Neutrox, D.O.C., Kleenite, Coleo, Nyko, Polident, Stera-Kleen and Ora. Commercial immersion denture cleansers appear to be harmless to denture plastics. Also harmless are the household cleansers, such as hypochlorite, baking soda, ammonia, vinegar and salt.

Substances which contain appreciable quantities of alcohol or essential oils are not indicated as denture cleansers.

On the basis of immersion tests, the commercial immersion denture cleansers seem efficient only in the removal of mucin deposited from the saliva and of loosely held food debris.

Since the commonly used brushes, abrasive cleansers, commercial denture pastes and dentifrices all cause scratching of the denture, they cannot be recommended for routine denture care.

A cleaning solution consisting of 1 teaspoonful of Clorox, or a similar hypochlorite, and 2 teaspoonsful of Calgon in a half a glass of water is an efficient and safe cleanser for an occasional overnight immersion. This solution is not indicated for routine use with any prosthetic appliance constructed with base metals.

School of Dentistry, University of Michigan, Ann Arbor, Mich.

Anesthesia and analgesia

Endotracheal anesthesia for surgical repair of clefts in lips, jaws and palates

H. Pflüger. *Anaesthesist, Berlin* 7:294-298 Oct. 1958

Some modification of the commonly used technics to induce general anesthesia (Adriani's circle filter technic and open drop method) have been used during the last seven years in about 700 children undergoing surgical repair of cleft lip, cleft jaw or cleft palate at the Oral Surgical Clinic of the University of Göttingen, Germany.

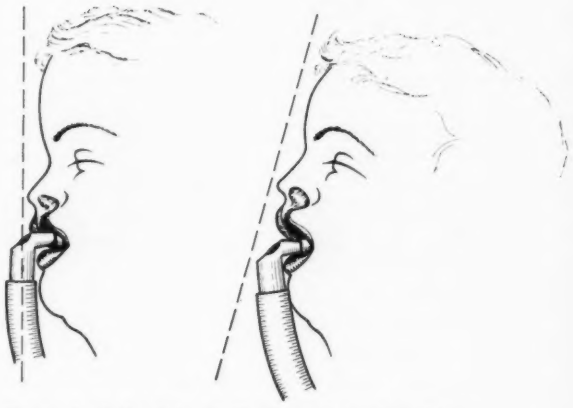
Endotracheal anesthesia was the method of choice in the following instances: (1) Le Mesurier's operation in repair of unilateral cleft lip; (2) Denis-Browne's push-back operation in severe instances of cleft lip and cleft palate; (3) Gelbke's operation in bilateral cleft lip; (4) Axhausen's operation in cleft palate; (5) Haynes pharyngoplasty to improve postoperatively the function of speech; (6) Rosenthal's operation to obtain repositioning of the palate with a velopharyngeal bridge; (7) all secondary operations, and (8) Veau's operation where there has been severe structural loss.

Normal development (5 Kg. body weight) is a prerequisite for surgical closure of unilateral and bilateral cleft lip in children from three to four months old. The optimal age for surgical repair of cleft palate varies between the fourth and the sixth year. Pharyngoplasty and all secondary (plastic) surgery can be delayed but should be performed before the time the child enters school.

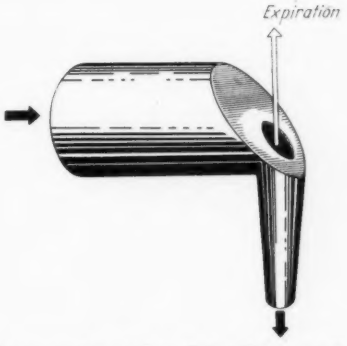
Anesthesia for surgical repair of all types of clefts must not only be safe but induced and maintained in such a manner that it does not interfere with the surgeon who wants at all times free access to the site of operation.

Premedication and induction of anesthesia are administered in the usual manner. Early use of the oropharyngeal airway is recommended to prevent obstructions such as the tongue falling into the cleft.

Fixation of the tube by finger pressure

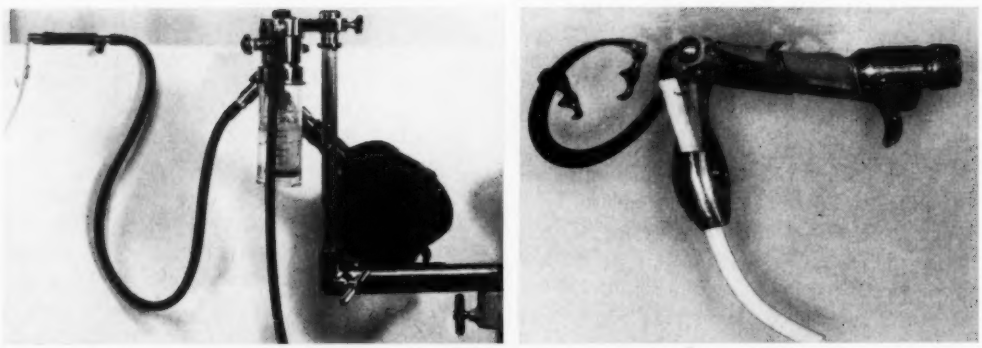


Removal of the tube. Left: Normal head position (wrong). Right: Reclined head position (right)



Tube connector used in cleft palate operations

Position of the tube in cleft lip operations. Left: Unilateral cleft. Right: Bilateral cleft



Apparatus for endotracheal and nasotracheal anesthesia. Left: Drager's apparatus. Right: Mouth opener and clamping lever (Russel Davies' modification of Green-Davis' gagging device)

Endotracheal and nasotracheal anesthesia. Left: Pharyngoplasty. Right: Repair of unilateral cleft palate

Endotracheal anesthesia usually is used in the second plane of the third stage, extreme care being taken to flood the lungs with oxygen under the mask just before intubation.

The patient's head is elevated on a padded ring which position assures stability of the head and flexes the neck on the shoulders. An especially constructed oral tube connector is used in cleft lip operations, whereas in cleft palate operations the tube is introduced nasotracheally. Oral intubation is particularly useful for cleft palate operations and for pharyngoplasty. A specially designed mouth opener is used; its tip is placed near the glottis. The oral endotracheal tubes must be long enough to reach from the lobe of the ear to the tip of the nose with 1 or 2 cm. to spare. No cuff is used on the tube because the cords are accommodated to the tube and no anesthetic mixture is lost.

Anesthesia is maintained with an apparatus which consists of the endotracheal tube, a metal connector with a bore the same size as the tube, a short piece of rubber tubing, and a metal piece containing the inhalation and exhalation valve. A reservoir bag, containing about two liters, and a rubber tube leading to the gas supply, are attached to the apparatus. Nitrous oxide and oxygen are supplied; if necessary, ether or cyclopropane is added for depth of anesthesia. This technic has been used in 54 per cent of instances; Ayer's technic in about 10 per cent; in the other instances, thiopental sodium as the basal anesthetic agent with nitrous oxide-oxygen were indicated, with as high a percentage of oxygen as possible.

Postoperative complications after endotracheal anesthesia seldom occurred. During the operation, blood loss must be replaced as soon as it occurs, preferably this should be done through a venous cut-down.

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Local anesthetics: agents for injection

American Dental Association,
Council on Dental Therapeutics.
Accepted Dental Remedies 24:22-29, 1959

Cocaine, the oldest of the local anesthetic agents, is principally of historical interest except for its limited use for surface anesthesia. The discovery that its local anesthetic properties are due to the benzoic acid nucleus in combination with a nitrogen-containing basic group served as the starting point in preparation of numerous local anesthetics of which procaine was the first important representative. Lidocaine is one of the few local anesthetics which is not a derivative of benzoic acid.

Since the discovery of procaine hydrochloride, hundreds of anesthetic compounds of the general type have been introduced. These compounds vary slightly in their potency and duration of action, but these characteristics are difficult to measure accurately by available procedures.

Local anesthetics for injection are employed in dental practice in the form of their hydrochloride salts which are soluble in water. Various other salts of procaine have been suggested, but they have not proved to be superior to hydrochloride.

Constant wetting of hands with solutions containing local anesthetic agents may cause dermatitis. A large proportion of dentists who exhibit inflammations of the skin after contact with procaine (Novocain) solutions are also hypersensitive to butethamine (Monocaine), tetracaine (Pontocaine), butacaine (Butyn) and other compounds of similar chemical structure.

Lidocaine (Xylocaine) hydrochloride, piperocaine (Metycaine) hydrochloride, metabutoxycaine (Primacaine) hydrochloride and meprylcaine (Oracaine) hydrochloride have been used successfully by some dentists who are unable to tolerate the local anesthetics which are derivatives of para-aminobenzoic acid. Contact dermatitis, however, may develop from repeated exposure to any of these drugs. Dentists who have a history of allergy should avoid unnecessary contact with all local anesthetics, regardless of their chemical configuration.

When local anesthetics are absorbed into the general circulation, they may exert toxic effects

through their actions on the higher nerve centers. Manifestations of these toxic actions are variable and depend on individual differences in patients, the rate of injection, the quantity injected and the influence of other drugs present in the solutions.

Agents currently used for local anesthesia at the dental office are not vasoconstrictors. Epinephrine or some other suitable vasoconstrictor, therefore, is added to the anesthetic solution. By localizing the solution at the site of injection, the vasoconstrictor intensifies and prolongs the anesthetic effect and decreases the rate at which the anesthetic drug enters the circulation. This decreased rate of absorption reduces the systemic toxicity of these mixtures. Symptomatic and local changes may be increased by the addition of epinephrine, although the actual danger to the patient is less than if epinephrine were absent. Vasoconstrictors decrease the hazard of hemorrhage during surgical procedures in the region of the injection.

Clinical experience has shown that the side reactions to local anesthetic solutions can be minimized by the following precautions: (1) prevent intravascular injection by attempting to aspirate before injecting; (2) use sharp needles (no smaller than 25 gauge) and inject the solution slowly; (3) use the smallest quantity and the lowest concentration of the least toxic anesthetic which will produce satisfactory local anesthesia, and (4) premedicate with a suitable barbituate in instances of patients who are known to have a tendency to react to local anesthetics with symptoms of cortical stimulation, and give the injection with the patient tilted back in the dental chair in a supine position.

Local anesthetics may produce a variety of local tissue changes. Such reactions can be promoted or influenced by ischemia, osmotic pressure, pH, irritating effect of drugs, preservatives and adventitious metal ions, or a combination of several of these factors.

For use in infiltration anesthesia, local anesthetics may be dissolved in distilled water or (preferably) in diluted physiological salt solutions or Ringer's solution. In order that such solutions may be isotonic, it is necessary to make allowance for the osmotic effect of the anesthetic salt.

It has been claimed that local anesthetic solutions with a pH near that of the blood are more efficient and less irritating to the tissues than more acidic solutions. Controlled tests have failed to verify such claims. Alkaline solutions have not proved to be superior under clinical conditions. The tissue fluids are well buffered and will neutralize the small amounts of free acid contained in local anesthetic solutions.

Solutions of procaine hydrochloride and similar local anesthetics tend to be unstable above their natural pH levels. The pH of a freshly prepared solution of procaine hydrochloride is about 5.5. The value of the solution on standing drops to about 4.1. The presence of the preservative, sodium bisulfite, contributes to a further decrease in the pH of the solution. Addition of alkaline substances such as sodium carbonate and sodium phosphate to procaine hydrochloride solutions increases the rate of hydrolysis of the local anesthetic and the rate of destruction of epinephrine. Such solutions, therefore, should be used soon after preparation. Excessive acidity as well as excessive alkalinity in local anesthetic solutions should be avoided.

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Use of barbiturates in dental treatment of diabetic patients

München.med.Wschr. 100:1619 Oct. 19, 1958

Q.—Is there a danger involved if barbiturates are used for anesthesia and preoperative or postoperative sedation in the dental treatment of diabetic patients?

A.—Intravenous injection of quick-acting and soluble barbiturates to induce anesthesia in diabetic patients prior to any kind of dental intervention is permissible only after consultation with the patient's physician and if the dentist has had adequate experience in the use of these drugs.

If these precautions are observed, barbiturates also may be used safely for preoperative or postoperative sedation of diabetic patients. Special attention, however, should be given to the sugar level of blood and urine before and after the dental procedure.

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Histology

The pattern of mineralization of human dental enamel

H. S. M. Crabb. *Proc.Roy.Soc.Med.* 52:118-122 Feb. 1959

From developing teeth obtained from individuals ranging in age from a 32 week fetus to a seven year old boy, 130 longitudinal, buccolingual and transverse ground sections were prepared and microradiographs made by the technic of Darling and Crabb (1956) with the one exception that a polyester resin was used in place of methlymethacrylate for the embedding of some specimens. The microradiographs were examined for the broad pattern of mineralization and the detail of the stages by which the pattern is built up in relation to the fine structure of the enamel.

The basic pattern of mineralization, as demonstrated by microradiographs, consists of two stages (illustration). First, there is a deposition of matrix in increments delineated by the striae of Retzius. This matrix may exist for a short while in a wholly organic state but is soon partly mineralized. This primary phase is shortly followed by a phase of higher mineralization, the secondary phase, which starts from the whole length of the existing amelodentinal junction and moves outwards toward the enamel surface. The time interval is small between the start of the primary and secondary phases. The secondary phase starts long before all the tooth form is laid down, so that the two phases are occurring simultaneously for the greater part of the mineralization process. The secondary phase starts to move out from the amelodentinal junction in the incisal or cuspal region of the tooth. The advancing edge of this phase is at first approximately parallel to the amelodentinal junction and later, as the outer border of the enamel is approached, it becomes parallel to the enamel surface. This pattern of mineralization is fundamentally different from that proposed by Diamond and Weinmann (1940), but is in general agreement with that deduced by Darling (1956) to explain the occurrence of zones of enamel hypocalcification in amelogenesis imperfecta.

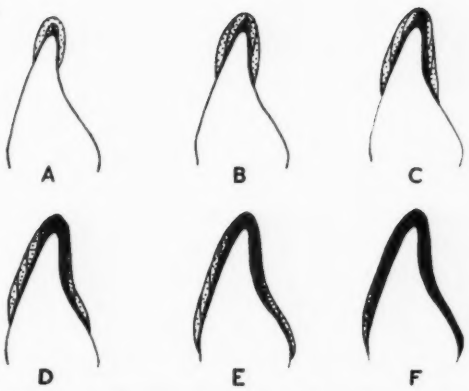

Diagram to illustrate the stages in the pattern of mineralization of an incisor tooth. Continuous lines represent incremental striae. The stippled zone is partly mineralized (primary phase). The heavily shaded zone indicates the spread of final mineralization (secondary phase)

The outer border of the enamel appears to mineralize before the zone immediately underlying it. In incisors and cuspids, the lingual enamel mineralizes before the labial enamel. In the primary phase of mineralization there appears to be a preferential mineralization of the prism core, so that mineralization spreads out from the center of the prism.

The pattern of loss of organic matrix in decalcified sections is no guide to the pattern of mineralization.

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Observations concerning a genus of viruslike mycotic organism and its relationship to some aspects of oral focal infection

Robert M. Box. *J.Ontario D.A.* 35:11-14 Oct. 1958

Examinations from 1953 through 1957 of tissue taken from postextraction alveolar lesions, apical and periodontal granulomas, swollen coronal sacs of impacted third molars, inflamed pulps, nerve branches dissected from postextraction lesions in the region of the lower third molar, and fluid from cysts have revealed one outstanding feature—the presence of motile coccoid forms. These changed from minute to larger and larger encapsulated bodies. Some evolved to develop either fine dot or filament forms within. Others agglutinated into clusters, some of which developed single bacillary forms on the edges whereas others developed mycelia. The mycelial filaments segmented into bacillary forms from one and a quarter to five times the diameter of the filament. These in turn developed either spore forms or granules; this type of filament was common to tissue adjacent to a rich oxygen supply, for example, to periodontal granulomas.

Apical granulomas in a subacute inflammatory stage consistently carried highly motile, medium-sized filaments which jerked, twisted and quivered. At an early stage the filaments are light green with small white heads about the same diameter as the filament, usually on both ends. As the filaments age they take on an orange hue. Some develop dot forms, like peas in a pod.

Encapsulated formations filled with some form of liquid develop from agglutinated clusters of swollen coccoid forms; these often appear from the third to the fifth day. They change shape from time to time.

Correspondence with the late James W. Papez in 1956 suggested the strong similarity between these oral mycotic organisms and the type of organism studied by him (1957). Papez had found such organisms in the brains of psychotic subjects, in red blood corpuscles, lymphocytes, glands, in sclerotic patches in blood vessel walls, in heart muscle cells, in gastric ulcers, in the spinal cords of patients with multiple sclerosis, and in the brain and marrow of epileptics.

These mycotic organisms, once established in the body, have the potential to create many types of neurologic and degenerative disturbances.

There is a genus of mycotic organism concerning which there is a dearth of knowledge. The organism involves several strains and many pleomorphic forms. These are to be found in alveolar and periodontal regions of oral pathoses and appear to be pathogenic in many systemic diseases.

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Special characteristics of the chemical composition of enamel in the regions of white carious spots, from histochemical data

A. E. Sharpenak, N. V. Nikolaev and E. A. Magud. *Stomat.,Moscow* 36:2:8 March-April 1957

White carious spots in extracted human teeth were examined histochemically to observe changes in the metabolism of the enamel in dental caries. The teeth were cut with a carborundum disk in such a way that the section passed through the white carious spot, which appeared on the outer edge of the section.

Twenty such teeth were stained with hematoxylin. Normal enamel remained unstained whereas the enamel of the white carious spot was dyed throughout an intense violet. Analogous results were obtained on four teeth with anthropurpurin. It is concluded that the dyeing in the white carious spots is caused by structural changes and not by an increased concentration of calcium.

Investigating enamel protein, many experiments were carried out in which modifications of the biuret reaction were used but without success. When a 0.2 per cent solution of ninhydrin was used in 30 sections with white carious spots, the dentin was dyed violet; normal enamel remained undyed or became a weak rose-violet; white carious spots dyed more intensely than the surrounding enamel. At the border between the white carious spot and the surrounding enamel there appeared a uniform, intense staining of dark violet, evidence of the accumulation of free amino acids.

The authors concluded that at the border between the white spot and the surrounding enamel there occurred a pronounced proteolysis in which the amino acids were freed.

Medghis, Petrovka 12, Moscow, U.S.S.R.

Histology of root canals

Walther Müller. *Bl.Zahnhk.,Zürich* 19:136-138 Oct. 1958

In the majority of human teeth the root canals do not run as one single tubular passage through the dentin, but separate into two or more branches near the apex. These divisions are called apical ramifications. Other branches run at right angles from the main canal to the root surfaces; they are called lateral ramifications. These frequent ramifications are of clinical importance for dental treatment.

In lower incisors and cuspids, a common anatomic variation is the occurrence of two main canals which separate either at the level of the pulp chamber or the apex. In about 25 per cent of upper cuspids examined, lateral branches extended at a right angle from the main canal in its apical portion. In upper bicuspids, anatomy and histology of root canals are complicated. Only 19.5 per cent of all upper first bicuspids examined have one single, wide root canal. The remaining 80.5 per cent have two canals with numerous fine branches, some of which connect the two canals and others form apical ramifications. In upper second bicuspids, however, the division into two root canals is less frequent; apical ramifications occur often.

Lower bicuspids usually have only one root canal; division into two separate root canals is more frequent in lower second bicuspids.

Lower molars vary in the number of root canals. The present study brought the following observations: (1) one root canal was found in 0.3 per cent of lower molars examined; (2) two canals were found in 17.7 per cent; (3) three canals were found in 78 per cent, and (4) four canals were found in 4 per cent. Apical ramifications occurred frequently involving all roots. Mesial root canals are often connected to each other by fine branches running horizontally from one main canal to the other. Lower third molars, however, usually have two canals with comparatively few ramifications.

Upper first and second molars generally have three root canals; also a division of the mesiobuccal canal sometimes simulates the presence of a fourth canal. Apical ramifications were found in more than 50 per cent of the upper molars examined. The root canals of upper third molars vary more than those of any other tooth; from one canal to five canals were found.

In the deciduous teeth the anatomic and histologic conditions are similar. Deciduous incisors and cuspids, as a rule, have short, wide, single root canals with occasional ramifications. Deciduous molars, however, have complicated root canals—from one to four canals, with many ramifications.

The relative frequency of apical and lateral ramifications in human permanent teeth is as follows: (1) upper central incisors, 25 per cent apical and 21 per cent lateral ramifications; (2) upper lateral incisors, 31 per cent apical and 22 per cent lateral; (3) upper cuspids, 25.5 per cent apical and 18 per cent lateral; (4) lower incisors (no significant difference between central and lateral incisors), 21.6 apical and 10 per cent lateral; (5) lower cuspids, 39 per cent apical and 12 per cent lateral; (6) upper first bicuspids, 41 per cent apical and 18 per cent lateral; (7) upper second bicuspids, 50 per cent apical and 19 per cent lateral; (8) lower first bicuspids, 44 per cent apical and 17.3 lateral; (9) lower second bicuspids, 49 per cent apical and 20 per cent lateral; (10) upper first and second molars (no significant difference between first and second molars), 67 per cent apical and 16 per cent lateral; (11) upper third molars, 80 per cent apical and 23 per cent lateral; (12) lower first and second molars (no significant difference between first and second molars), 73 per cent apical and 13.5 per cent lateral, and (13) lower third molars, 10 per cent apical and 6 per cent lateral ramifications.

In histologic specimens these ramifications can be studied in serial sections.

Römerhof, Zurich, Switzerland

Physiology

Human salivary glands and their relations to the metabolism of enzymes, hormones and minerals

Th. Port. *Zahnärztl.Praxis* 9:217 Oct. 1, 1958

The amount of saliva secreted by all salivary glands of a healthy human adult varies between 500 and 1,000 Gm. daily.

Amylolytic enzymes, mainly produced by the parotid gland and the accessory parotid glands (socia parotidis), convert polysaccharides (starch) into sucroses such as amylopsin, malt diastase and ptyalin. The optimal effect of amylase in human saliva is produced at a pH of 6.8 and is probably influenced by the secretion of chlorine ions by one of the salivary glands.

In human saliva the following enzymes can be distinguished: hydrolases such as lipase, phosphatase, sulfatase, maltase and amidase. The salivary glands also excrete urea and uric acid. These glands are slightly permeable by amino acids (the main structure of protein), and impermeable by sucroses.

According to Japanese researchers, the salivary glands have additional internal secretory functions which, however, are as yet not definitely established.

Diabetes mellitus is often associated with characteristic swellings of the parotid gland, which excretes a hormone similar to insulin that stimulates the pancreas to secrete more insulin to control the carbohydrate metabolism. Hypertrophy of the parotid gland, however, is not always associated with disturbances of the endocrinous activity of the pancreas but occurs during the course of other diseases such as cirrhosis, hypofunction of ovaries or testicles and protracted dystrophies.

In Japan, a hormone has been isolated recently from the parotid glands of cattle which exerts a definite influence on the metabolism of minerals. This hormone, called "Parotin," decreases the nitrogen output of urine, decreases the quotient of albumin and globulin and activates the adrenocorticotropic function of the hypophysis. Atrophy of the parotid gland, caused by arthritis deformans or spondylitis deformans, can be influenced favorably by Parotin therapy.

Definite correlations exist between the salivary glands and the metabolism of fluorine, sodium, potassium and calcium. In investigations of the role human saliva plays in susceptibility and resistance to dental caries, an antagonism between the functions of the salivary glands and those of the reproductive glands has been established. Several animal experiments have proved that in castrated animals the incidence of caries decreases even when a cariogenic diet has been given. Extirpation of the salivary glands, however, was followed by an immediate increase in caries frequency.

By determination of the level of sodium and potassium in human saliva, inflammatory and noninflammatory diseases occurring in the oral cavity can be differentiated.

An abnormal increase in the mineral contents of the saliva leads to formation of calculi in the salivary glands, frequently in the submaxillary glands, less frequently in the parotid gland and hardly ever in the sublingual glands.

Weissenau/Ravensberg, Germany

Development of proprioceptive reflexes in the muscles of mastication

A. P. Marevskaya. *Bul.Exper.Biol.& Med.,USSR* 44:1427-1430 Dec. 1957

Although reflexes involving mouth movements are well developed in the embryo, no precise description of the development of the masticatory reflexes has been given as yet. The tone of the masseter muscles, and their proprioceptive reflexes of extension, were studied in 36 kittens from two hours to 30 days after birth. A cathode ray oscillograph and amplifier were used to record the activity of the masticatory muscles. Fine needle electrodes were inserted into the central and distal portions of the muscles. To stretch the muscle, a load was hung on the lower jaw, or else the muscle was partially separated and a load attached to the distal end.

It was established that the muscles of mastication show electric activity from the first hour

after the birth of kittens. The greatest electrical activity in the masseter muscles occurs while the kittens are feeding on milk.

Proprioceptor stretch reflexes in kittens are of the same general type as those in adult animals but there is some variation with age, and in kittens the reflexes are not well maintained and are rapidly inhibited. In kittens there is a widespread irradiation of proprioceptor excitation in the central nervous system. As in adult cats, the effect depends largely on the amount the muscle is stretched.

Leningrad Pediatric Medical Institute, Leningrad, U.S.S.R.

Resorption of deciduous teeth and eruption of permanent teeth

Guido Fischer. *Schweiz.Mschr.Zahnhk.* 68:369-393 May 1958

Normal hormonal secretion of the endocrine glands produces a gradual resorption of the structures of deciduous teeth causing the timely shedding of these teeth to permit undisturbed eruption of the permanent teeth.

The normal activity of the pituitary gland, the thymus and the hypophysis is mainly responsible for an undisturbed course of tooth eruption. It may be assumed also that the hormones excreted by the thyroid and parathyroid glands play a supplementary role in the eruption process.

Disturbances in the hormonal metabolism create certain defined anomalies in tooth resorption and eruptions such as delay or acceleration, disorder in the rhythm of eruption, and increase or decrease in size without hastening the eruption rate.

Complete harmony in the resorption of deciduous teeth and eruption of permanent teeth occurs only in children with a balanced hormonal secretion.

These observations, therefore, must lead to the conclusion that the processes of tooth shedding and eruption depend on and are regulated by a synergism within the endocrine hormonal metabolism, especially of the secretion of the pituitary growth hormone and the thyroid hormone. The first stimulates the basic process of tooth growth and development, and the second controls the differentiation and maturation of the permanent teeth prior to eruption.

Berg bei Starnberg, Oberbayern, Germany

Sebaceous glands in the lip and cheek mucosa of man

A. E. W. Miles. *Brit. D.J.* 105:235-248 Oct. 7, 1958

In many people there may be observed in the red margin of the upper lip, especially if the mucosa is stretched, small yellowish bodies situated immediately beneath the mucosa. Similar yellow spots are not uncommonly found in various parts of the cheek mucosa. These yellow spots are sebaceous glands. These sebaceous glands increase in number after adult life is reached. In both young and old patients, buccal sebaceous glands are present in such large numbers that their secretion may contribute to the oral environment.

An attempt was made to study some of the problems that arise in connection with these glands. Clinical observations on 252 subjects were made and 180 specimens of cheek mucosa from autopsies were examined, together with some biopsy and fetal material.

The clinical survey confirmed the observations of Kölliker (1862) as to the distribution of sebaceous glands of the lips. These glands in the form of yellow spots rarely were present at the mucocutaneous junction. When there was a row of glands across the lips, the region of the midline was usually, but not invariably, devoid of sebaceous glands. Such glands were rarely seen on the lower lip, and then only close to the angle of the mouth.

On both lips and cheeks there was a striking symmetry between distribution, number and size of the glands on opposite sides of the body. There was little association between the prevalence of glands on the lips and on the cheeks. Sebaceous glands were found in all parts of the cheek mucosa and were not confined to the middle zone. In the cheeks, sebaceous glands were most commonly found in small clusters immediately lateral to the angle of the mouth, in clusters a little below the occlusal plane, in the region of the parotid papilla, and of the thin mucosa lateral to the anterior pillar of the fauces.

The subjects examined were in four age groups: 5 to 10 years old, 18 to 24, 35 to 45, and over 60 years old. It is not uncommon to find sebaceous glands in the lips and cheeks, even in large numbers, before the age of puberty. A substantial increase in the prevalence of these glands in the lips occurs between childhood and young adulthood. In view of the well-known increase in sebaceous activity that occurs at puberty, it is reasonable to assume that this increase is related to puberty. A substantial increase in the number of glands in the cheeks occurs in later life, some time after maturity. The sex differences are not significant.

No sebaceous glands were found in the lip or cheek mucosa of five serially sectioned human fetuses, but a few glands were noted in autopsy specimens of cheek mucosa from infants.

The cellular morphology of sebaceous glands in the lip and cheek mucosa is similar to that of sebaceous glands found in association with hair follicles in skin, except that the latter, of course, empty by a duct which opens into the side of the hair follicle itself.

There appears to be little information available on the histologic changes that skin sebaceous glands may undergo with age, but the sebaceous glands of old people sometimes are enlarged (Cooper, 1952). It is probable that this enlargement is a manifestation of increased sebum storage rather than of increased secretion. It may well be that the large size of the oral sebaceous glands of older people likewise is due to increased storage of sebum rather than increased secretory activity. No association was noted between the presence of oral sebaceous glands and acne vulgaris or other sebaceous disorders.

The clinical survey suggests strongly that sebaceous glands spring anew from the buccal mucosa after adulthood is reached, at a time when new organs or tissues are hardly expected to arise.

Oral sebaceous glands have been found in the chimpanzee and the hedgehog. Whether such glands play any part in the economy of the organism is a question which as yet remains unanswered. The postulation of any useful function would have to take account of the fact that the glands are present in significant number in only about 60 to 75 per cent of adults. It would seem more probable that, like body hair in man, they are the remains of a once functional organ or tissue.

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Postoperative growth of the lower jaw after surgical removal of the condyles in macaca rhesus monkeys

S. Tomek. *Wien.klin.Wschr.* 70:892-895 June 14, 1958

A series of studies was carried out to determine the effect of the surgical removal of one or both condyles on the growth of immature lower jaws. Ten rhesus monkeys of the macaca species, eight months old, were used, this species being the only readily available animal with a facial structure closely resembling that of man. Five monkeys served as a control group.

In two animals the right mandibular condyle was resected, and in three both condyles were removed.

Roentgenographic examinations were made one week prior to surgery, immediately after surgery and at six month intervals postoperatively.

Plaster casts were made from the teeth and jaws at regular intervals. The postoperative survival period ranged from 4 to 17 months. The heads of the sacrificed animals were dissected and photographed.

Surgical removal of a condyle did not produce ankylosis of the temporomandibular joint. New growth, substituting for the loss, appeared and provided adequate masticatory function. It became evident, however, that the condyloid process is an important growth center; after its removal the growth of the ascending ramus ceased completely. Arrest of mandibular growth resulted in an asymmetrical deformity of the face when one condyle had been removed, and a symmetrical deformity when both condyles were resected.

The importance of the condyles as growth centers should be kept in mind whenever the question of surgery in the neighborhood of the temporomandibular joint, or of the joint itself, arises during treatment planning in children.

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Pathology

Kidney changes in acute inflammatory processes of the jaw

V. Z. Skorobogatko. *Stomat.,Moscow* 36:1:42-47 Jan.-Feb. 1957

Examinations of 504 patients suffering from odontogenic osteomyelitis of the jaw showed that in 292 patients (58 per cent) some pathologic changes in the urine were present. An albuminuria with from 0.03 to 0.3 per cent serum albumin was determined. The highest amounts of albumin were observed in patients with abscesses and sepsis. The arterial blood pressure was normal in 83.2 per cent of the patients.

The renal functional insufficiency was evidenced also by secretion of urine with a low specific gravity, and by some increase of the creatinine level in the blood. In these patients, essentially an acute toxinfectious renal damage occurred, similar to that caused by an interstitial nephritis. After removal of the odontogenic inflammatory process, the changes in the urine rapidly disappeared.

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Retrocalcaneal bursitis: an occupational disease

J. C. A. Steffensen and A. Evensen. *Acta orthop.Scandinavica* 27:228-236 March 1958

Retrocalcaneal bursitis, also known as achillobursitis, is an occupational disease which occurs mainly in persons whose occupations force them to endure continued stress to their feet and legs. Pain in the heel is the major symptom which usually is associated with numbness in the feet, cramps in the legs and inflammation and swelling of the bursae about the Achilles tendon, especially in the anterior bursa.

This syndrome is observed often in military personnel (caused by marching), mailmen (caused by walking) and dentists (caused by standing). The initial pain in the heels is aggravated by uninterrupted occupational stress, direct pressure, poorly fitting shoes and any form of injury to the foot, especially to the Achilles tendon.

An increased feeling of tension in the tendon forces the patient to rest the foot, usually in a position in which the plantar surface is elevated, causing the person to walk on the toes (talipes equinus).

Pathologic changes, occurring in retrocalcaneal bursitis, vary from mild aseptic inflammation in the bursa between the upper posterior surface of the calcaneus and the Achilles tendon to osteitis and hypertrophic alterations in the posterior surface of the bone itself.

Three case reports are presented in which the pathologic changes occurring in dentists are demonstrated in lateral soft-tissue roentgenograms of the feet. There were several abnormalities observed such as an increase in the lever angle of the heel, prominence of osseous tissue on the upper posterior surface of the calcaneus, and an altered relationship of the Achilles tendon to its surrounding structures.

The lever angle of the calcaneus is defined as that angle which is formed between the line running from the calcaneal tuberosity (the upper point of the Achilles tendon) to the deepest point of the tarsal sinus, and a second line running from the tuberosity to the upper posterior point of the posterosuperior edge of the calcaneus. In the average person the lever angle is 60 degrees. In patients with retrocalcaneal bursitis, however, this angle is excessive (above 65 degrees).

Studies of the heel bones in 250 roentgenograms of soldiers, mailmen and dentists, revealed the presence of significant pathologic changes. The patient's history (in the majority of instances) revealed a previously undiagnosed and untreated retrocalcaneal bursitis.

Treatment of the lesions depends on the severity of the symptoms. Roentgenotherapy obtains temporary relief only. Radical surgery is the method of choice, employing the lateral approach sparing the Achilles tendon and excising the inflamed bursa and any existing bony prominence disturbing the tendon.

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Metastases from oral carcinomas

Josef Šveda. *Prakt.zubni lékař.* 6:198-205 Sept. 1958

Carcinoma of the oral cavity is considered to be a malignant tumor which does not spread below the level of the clavicle. Death usually occurs as a result of direct or indirect effects of the primary neoplasm or of regional metastases and not from remote or visceral metastases.

In many instances of untreated or tardily treated oral carcinomas, specific or nonspecific toxemia, dehydration and malnutrition combine to produce a gradual inanition which leads to death. Hypostatic bronchopneumonia or necrotizing pneumonia are often the immediate cause of death.

Distant metastases from oral carcinomas are infrequent. In a study of 687 case histories, only 1.34 per cent died of visceral metastases, and 57 per cent were known to have died from complications associated with the primary tumor.

With the increasing ability to control the primary neoplasm as well as the metastases in or near the oral cavity, the lifespan of patients can be lengthened. Simultaneously with the increased survival time, however, the occurrence of distant metastasis is observed more frequently.

The increased interest in patients with advanced carcinoma in the oral cavity probably will uncover many instances of distant metastases which had been overlooked in previous investigations.

A review of the pertinent dental and medical literature revealed that of the organs involved in distant metastases of oral carcinoma, the lungs and bones rank first. Primary tumors situated posterior to the anterior pillar of the fauces are more prone to produce distant metastases than those located in the oral cavity.

Statistically, it would be far more rational to obtain data on oral tumors and their metastases from clinical experience than from autopsy reports. Only by combining these reports could a clear conception be obtained as to whether distant metastases of oral tumors play a more significant role than anticipated.

The problem of treatment and cure of carcinoma of the oral cavity can be solved only by early control of the primary lesions and recognition of the regional metastatic spread. If this difficult task can be accomplished, the patient has a far greater chance to survive.

In contrast to the discouragingly high percentage of deaths from malignant metastasizing tumors of the breasts, lungs, stomach and rectum, there are comparatively few deaths from metastasizing oral tumors such as uncontrolled squamous cell types of epidermoid carcinoma.

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Trismus hystericus after extraction of deciduous molars: report of case

Joachim Sellach. *Zahnärztl.Rundschau* 67:109-110 March 5, 1958

Trismus hystericus, caused by a psychogenic reaction to the extraction of two lower deciduous molars, was observed in a six year old girl at the Dental Clinic of the Rudolf Virchow Hospital in Berlin.

According to the dentist and the mother, the girl did not show any signs of an abnormal fear of dental procedures or local anesthesia prior to the tooth extraction. Immediately after extraction, however, cramps of the muscles of mastication occurred and led to complete trismus. The patient was unable to speak and to eat.

Treatments by the family physician and later by a pediatrician were unsuccessful.

After two days, the patient was referred to the dental clinic. Physical examination showed a thin, pale, undernourished child who was unable to open her jaw. Roentgenographic examination showed a normal temporomandibular joint without any signs of ankylosis. There was no evidence of lesions of the central nervous system, muscular infection, oral abscesses or myositis.

As in all instances of trismus, the underlying causes received attention. In this case, the obvious causative factors were psychogenic: a hidden hysteric anxiety and an emotional shock both due to tooth extraction and anesthesia, as well as a psychic handicap due to the feeling of being neglected by mother and stepfather who seemingly favored her brother. Physiotherapy (exercising

the jaws) and diathermy were unsuccessful. Psychotherapy by sudden catharsis obtained the desired improvement and cure. In the presence of the child, it was suggested to the mother that if the girl could not open her mouth immediately, there was nothing the clinic had to offer and any hope for cure must be abandoned. This suggestion served as a contrashock. The girl opened her mouth, answered slowly some questions and shared with the dentist a rich dinner.

At a re-examination two months later, it was found that she was eating and speaking well and without any discomfort. Later, another tooth extraction was carried out uneventfully.

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Cylindroma of the maxillofacial region

Herbert Mehnert. *Fortschr.Kief.Ges.Chir.* 4:371-374 1958

Cylindroma of the maxillofacial region is not easy to diagnose. There is a tendency to label as a cylindroma any type of tumor that lacks features which will permit its ready recognition. Cylindromas, however, are characterized by cylinders of hyaline containing epithelial tumor cells.

If malignancy of an oral cylindroma is considered solely in terms of the length of survival of the patient, then the adenoid cystic type of mixed tumor (cylindroma) must be considered as a benign neoplasm. From the clinical point of view, however, cylindroma must be regarded as malignant because it is capable of metastasizing. Although the appearance of metastases from an oral cylindroma may be delayed for many years, they may cause an almost complete destruction of osseous tissue. No instance of metastases from a cylindroma of the palate has been reported in the literature.

In view of the sinister potentialities of oral cylindroma, the immediate radical surgical excision of the primary tumor is a matter of greatest importance.

After surgical removal of the primary tumor and roentgenotherapy, new tumors may form which in most instances can be treated with cauterization or resection combined with irradiation.

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Pain in the tongue

J.A.M.A. 168:843-844 Oct. 11, 1958

Q.—A 59 year old woman with multiple sclerosis complains of periodic bouts of neuralgic, knifelike pain in the right side of her tongue. Examination of the tongue, teeth, pharynx, larynx and neck is unrevealing. She has taken various medicaments without appreciable relief. Please give suggestions for further therapy.

A.—Knifelike pain in the tongue in multiple sclerosis is unusual. Textbooks contain no discussion of this phenomenon, and experts seem to have had no experience with it. Pain on the right side of the face is not unusual, but, limited to the tongue, it is exceptional. The only suggestion would be to attempt procaine alcohol block for the branch of the fifth (facial) nerve which supplies the innervation to the tongue. Topical applications would be useless.

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Fibroma symmetrica gingivalis

Sölve Olvén and Jan Stahle. *Svensk tandläk.Tskr.* 51:549-553 Sept. 1958

Fibroma symmetrica gingivalis is a rare type of symmetrical hyperplasia of the gingivae, characterized by thickening of the soft parts of the palatal surface of the alveolar process. The palate becomes narrowed, and speech and chewing defects may result.

A 28 year old woman had a ten-year history of a slowly growing bilateral fibroma which had reduced the hard palate to a narrow groove. All upper teeth were extracted because of their poor condition, prior to extirpation of the fibroma. Histologic examination revealed diffuse fibromatous hyperplasia with abundant collagenous elements.

Irritative, phylogenic, endocrine and hereditary factors have been considered in the genesis of symmetrical fibroma. In favor of a hormonal causative factor is the fact that hypertrichosis was present in the patient described, and also in other patients that have been described in the literature.

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Candidosis [candidiasis] following antibiotic therapy

Giuseppe Giunchi. *Sc.med.ital.* 6:580-628 April-June 1958 [in English]

With the widespread use of antibiotics in the last decade, some mycoses have appeared more frequently and with exceptional severity. This has led to recognition of a particular type of fungus infection: mycosis after antibiotic therapy. The etiological agents responsible for most of the mycoses so far observed after antibiotic treatment are fungi belonging to the Candida genus; the disease they cause is therefore candidosis [candidiasis].

In 1,212 subjects investigated by the author, 601 strains of yeast were found; of the 601 strains, 537 were Candida. However, Candidae in general, and *C. albicans* in particular, frequently are present in man, independently of the existence of candidiasis. The fungus is present in the mucous membranes (oral, intestinal and vaginal) with varying frequencies. In healthy adults and children, Candidae have been found with a frequency ranging from 4 to 28 per cent, whereas in ill subjects the frequency rises to from 60 to 73 per cent. The highest percentage of positive findings is recorded among patients affected by malignant diseases (73 per cent). A particular condition, midway between the findings in healthy and sick subjects, is that encountered in immature children, which show 48 per cent positive findings.

In patients undergoing antibiotic treatment, Candidae are found in between 45.7 and 65.8 per cent. Antibiotics therefore exert a favoring action on the saprophytic development of Candidae on mucous membranes.

Although saprophytic Candidae are found more frequently on the mucous membranes of healthy, and particularly of sick, subjects receiving antibiotic treatment, the occurrence of pathologic processes which can be referred with certainty to yeasts is not correspondingly frequent. Although Candidae have been found on the oral mucous membranes and in the feces of 65.8 per cent of patients receiving antibiotic treatment, the finding of pathologic processes which could be identified with certainty as candidiasis occurred only in 9.6 per cent of such patients. In childhood, however, the incidence of candidiasis is 28.6 per cent in those undergoing antibiotic treatment and 17 per cent in untreated children. In adults, the incidence of candidiasis is so rare (4 per cent) that it is difficult to say if any relation exists between antibiotic treatment and candidiasis.

Among 279 patients receiving antibiotic treatment, 17 (6 per cent) had candidiasis; among 239 subjects not receiving antibiotic treatment, only 4 (1.6 per cent) had candidiasis; this difference is statistically significant. The whole of the afore-mentioned data suggests that:

1. Even in the present antibiotic age, candidiasis is primarily a childhood disease.

2. In childhood, the administration of antibiotics is accompanied by a more frequent occurrence of candidiasis.

3. In adults, candidiasis is rare, and the administration of antibiotics does not seem to affect its occurrence so noticeably as to constitute a relevant clinical problem.

Oral candidiasis occurs not only in the usual form of thrush but as an erythematous stomatitis, characterized by an almost complete absence of the typical whitish patches, and by the presence of an intense, diffuse erythema of the oral mucous membrane which becomes dry and loses its epithelial layer. This type of lesion occurs particularly in subjects who have an abnormally high sensitivity toward the yeast. Similar lesions have occurred in patients receiving antibiotic treatment, particularly penicillin and streptomycin by aerosol. The antibiotic seems to be the main cause of the erythema and epithelial loss, which is particularly evident on the lingual mucosa.

Another form of tongue disease, in addition to atrophic glossitis, which may appear in the course of antibiotic treatment is the so-called "black hairy tongue."

C. albicans was isolated in 8 of 12 healthy subjects to whom penicillin had been applied locally on the tongue with a swab, and in 12 of 15 patients in which a black hairy tongue had developed in the course of antibiotic treatment. However, because *C. albicans* was absent in 3 of the 15 patients (20 per cent) with black hairy tongue, *C. albicans* is not the etiologic agent re-

sponsible for this disease which, therefore, cannot be considered a candidiasis.

From the oral mucosa, Candida can spread its pathogenic action to the exterior and cause the development of erythema and fissures at the angles of the mouth (cheilosis or perlèche).

In the pathogenesis of perlèche, importance should be attributed to basal deficiency conditions, which favor its development. The appearance of fissures at the angles of the mouth is one of the most frequent symptoms of the dystrophic-deficiency syndrome following antibiotic treatment.

As with black hairy tongue, two main factors—yeast and dystrophy—are involved in the development of perlèche.

Of 50 instances of thrush investigated by the author, 22 occurred in immature children, 24 in sucklings and only 4 in adults.

Of thrush in 13 immature children, 11 had been treated with tetracycline, one with penicillin and one with a mixture of neomycin and bacitracin. Among 20 nonimmature subjects with thrush, tetracycline had been administered to 16, a mixture of penicillin and streptomycin to one, and penicillin alone to one.

Other forms of candidiasis are described. The bibliography lists 130 references.

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Malignant melanoma of the hard and soft palate

W. B. Hales. *Proc.Roy.Soc.Med.* 51:698 Sept. 1958

A 51 year old woman observed two small black spots in the center of her hard palate but did not seek any medical advice until four years later when the condition had progressed to involve practically the whole of her hard palate with a considerable extension into the soft palate. No lymphatic spread was detected and roentgenograms of her lung fields appeared clear. A biopsy from the left side of her hard palate confirmed the diagnosis of malignant melanoma.

The palatal mucosa was removed as far beyond the limits of the pigmentation as practicable and the exposed surface was covered with a Thiersch's graft.

Three weeks later a lymphatic swelling was observed at the anterior border of the right sternomastoid muscle. A block dissection of the glands on this side was advised and an extensive chain of pigmented lymph nodes removed. Five months later, further lymph nodes were palpated behind the patient's right ear, and these became increasingly pronounced during the next two months. There followed a paralysis of the right external muscle, pain in the right tibia and porosity of one rib. Eleven months after the first examination she relapsed into unconsciousness and died three days later. There was never any evidence of a local recurrence of the palatal melanoma.

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On allergy—points of interest to the dentist

Bertil Magnusson. *Svensk tandläk.Tskr.* 50:465-474 Aug. 1957

Two types of allergic conditions—those caused by drugs and those caused by dental materials—are of special interest to the dentist. The risk of allergic sensitivity to drugs is greater to the patient than to the dentist. The risk of allergy caused by dental materials usually is greater to the dentist.

Of the drugs used in dentistry, penicillin most often provokes allergic responses. Two case reports demonstrate that even small amounts of penicillin introduced into a tooth socket or root canal may evoke states of supersensitivity endangering the patient's life.

The allergy caused by penicillin differs in some respects from other drug allergies. With other drugs, the symptoms disappear when the drug in question is discontinued. Urticaria often develops in connection with penicillin; sometimes the urticaria does not appear until several weeks after treatment, and it may last for months.

Eczema often develops after topical treatment with penicillin paste or in instances where penicillin happens to touch the fingers. Glossitis often results from topical application of penicillin in the oral cavity.

In severe instances, penicillin allergy may lead to shock; the patient may die within five to ten minutes if adequate shock therapy is not given.

The most serious complications occur when the patient already has some type of asthma or hay fever, or if the drug is given together with iodine or procaine hydrochloride.

Urticaria caused by penicillin usually can be cured in a few days with the administration of ACTH or cortisone. Penicillin shock is treated with injections of epinephrine.

Sensitivity to dental amalgam is seldom found in patients; when it occurs, it appears as an eczema on the face. Sensitivity to chrome or nickel used in dentures is extremely rare. Pure gold causes no allergies. Allergic skin and tissue reactions can result from contact with the monomer in acrylic resin. Direct exposure of the skin or tissue to monomer should be avoided.

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Congenital hematoporphyria (porphyrocytosis): report of case

W. Stick. *Schweiz.med.Wschr.* 88:1012-1014 Oct. 11, 1958

Congenital hematoporphyria appears in early childhood. It is assumed that this disease is caused by metabolic defects and characterized by an increased production of hematoporphyrin demonstrable in the blood, in urine and feces, and sometimes in facial and oral tissues. Vesicular and eczematoid dermatitides appear on the parts of the skin which have been exposed to roentgen rays or the sun. Dermatitis is followed by severe cicatrization.

In the case reported, the patient, a six year old boy, showed symptoms which could not be associated with a metabolic defect but rather with a localized blood disease: erythropathic hemolytic anemia. All his teeth and some of his bones were dark red, probably produced by the decomposition of erythrocytes. Hyperemia of the pulp of several teeth and hematogenous embolism in the blood vessels of the gingivae were observed.

Because the pathochemical cells, porphyroblasts and porphyricytes, could be determined by histopathologic examination of their characteristically high content on uroporphyrin I and coproporphyrin I, this disease should be named "porphyrocytosis." In most instances, biochemical blood defects can be determined, localized in the hematoporphyrin biosynthesis which occurs during the formation of hemoglobins in the porphyroblasts.

The prognosis of porphyrocytosis is unfavorable because no curative treatment is known. In the case reported, splenectomy was performed which—combined with repeated blood transfusions—resulted in improvement.

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Psoriasis of the mouth

Robert Leaver. *Brit.M.J. No.* 5094:513 Aug. 23, 1958

Psoriasis of the mouth, although not common, also is not rare. At the Royal Dental Hospital of London, a number of patients with this condition are seen. The oral lesions more often than not attack the upper surface of the tongue, and appear much the same as the lesions of the skin; that is, the central scale with the surrounding reddened ring spreading outward. Oral lesions usually occur in conjunction with lesions of the skin.

Lesions also occur on the buccal mucosa, and can be mistaken for lichen planus. Some form of irritation—a jagged tooth or ill-fitting denture—appears to be the originating cause. Such lesions are treated in the electrotherapy department by means of concentrated actinic rays (the titanium arc lamp), with satisfactory results.

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Spontaneous dental caries in animals

Ivaldo Rudinu. *Minerva stomat.* 6:399-405 Dec. 1958

The morphogenic and morphopathologic processes of dental caries in animals were studied at the Dental College of the University of Cagliari, Sardinia, Italy.

Specially designed instruments recorded microscopic, stereoscopic and roentgenographic data of the different stages of caries development.

The investigation included examination of 59,198 animal teeth (889 from cattle, 307 from horses, 46 from donkeys, 100 from pigs, 130 from

sheep, 209 from dogs and the rest from different rodent species).

Pathologic or traumatic discontinuity of tissue, similar to the carious lesions in man, were found only in 101 teeth. The remaining lesions could be classified as mechanotraumatogenic alterations.

After reviewing all data obtained, the following conclusions were reached:

1. Spontaneous caries, similar to that in man, does not occur in animals.

2. The rare instances of caries in animals reported in literature were manifestations of traumatogenic changes occurring on the surfaces or within the teeth.

3. The resistance to caries of animals is probably produced by as yet unidentified general and local factors within the defense mechanism.

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Morphogenesis of Capdepont's disease

E. Jahn and R. Zellner. *Arztl.Wschr.* 13:653-655 July 18, 1958

In dentinogenesis imperfecta (Capdepont's disease), the primary clinical symptom is the imperfect development of the dentin which is discolored (dark yellow or brown) and translucent. In most instances, the enamel structure is normal. Sometimes the dentin tubules are reduced in number, and run an irregular course in an atypical direction; they may exhibit numerous branchings.

The secondary clinical symptoms are a systematic early degeneration of odontoblasts and an obliteration of the pulp canal.

Microchemical examination reveals an abnormally high content of water in the translucent dentin (from 15 to 20 per cent, compared with the normal content of from 8 to 10 per cent), and an abnormally low inorganic content (from 70 to 75 per cent, compared with the normal content of from 80 to 85 per cent).

Roentgen diffraction studies reveal no significant difference in molecular structure of inorganic parts between translucent and normal dentin.

Deciduous and permanent teeth may be afflicted. The tooth crowns may be of normal size or somewhat shorter but the roots are always decreased in length.

Capdepont (1903) was the first to report this disease after observation of a French family where it was traceable in four generations.

Stainton (1892) described a similar condition which he named "crownless teeth."

Hodge and Finn (1936) examined chemically and physically the structures of teeth afflicted with dentinogenesis imperfecta, which disease they called "hereditary opalescent dentin." They found disturbances in development in both the enamel and the dentin.

Chaput, Lepoivre and Roisin (1952) published the history of a French family in which 9 of 12 members had dentinogenesis imperfecta.

In the American and French literature, only 65 case reports of dentinogenesis imperfecta have been published.

There seems to exist a characteristic Mendelian dominant factor which, however, is not sex-linked. Although the incidence of dental caries is below normal in all patients with dentinogenesis imperfecta, there exists a tendency to the formation of periapical abscesses.

Two half sisters (two and six years old) with dentinogenesis imperfecta were examined recently at the Dental School of the Humboldt University in Berlin.

The common father, but neither the mothers nor other brothers and sisters, had the disease. In five generations of the father's family, there were ten demonstrable instances of the disease and seven instances of keratosis palmaris et plantaris. No case histories of the families of both mothers were obtainable. The combination of these two hereditary or idiopathic conditions, dentinogenesis imperfecta and keratosis palmaris et plantaris, seems unique because no such reference has appeared in the American and French case reports.

Full-mouth roentgenograms of both children revealed defective crowns, shortness of roots, translucency of dentin and fissures in the enamel. Hypoplastic enamel and discolored, translucent dentin were found in all erupted deciduous teeth in both children. There was also rarefaction in the periapical regions. The question whether the permanent teeth will be afflicted remains unanswered.

Dentinogenesis imperfecta is obviously caused by a hereditary factor which acts during tooth development and mineralization. In the differential diagnosis, enamel hypomineralization—whether idiopathic or hereditary—should be considered. This condition is a separate disease entity.

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Dormant cancer cells of oral tumors

W. Dontenwill. *Deut.med.Wschr.* 83:1779-1782 Oct. 3, 1958

The time elapsing between surgical removal of malignant oral tumors and the recurrence of secondary tumors varies from a few months to 30 years.

In instances in which the interval is comparatively short, it can be assumed that the secondary tumor is the product of a continuous proliferation of cells or microscopic cell fragments and their growth. Some of the secondary tumors may be portions of the primary tumor which have escaped excision. Others may be tumor fragments which had reached distant sites by lymphatic, venous or arterial embolization before the tumor was removed.

In instances in which the interval has lasted for six years or more, the cells of dormant growth are undoubtedly in a state of mitotic (temporary) arrest. These dormant cancer cells, however, lose none of their capacity to grow again and infiltrate rapidly and widely.

Dormant cancer cells may exist at or near the operative site for long periods of time. It can be assumed that the mitotic arrest has been induced by anoxia or metabolic deficiencies, and that the mitosis could be re-established if adequate oxygen became available by vascularization of the scar.

At present, there is no reliable information available in regard to the environmental factors which induce mitotic arrest of tumor cells in human tissue. When protected against the physical effects of extreme cold, the cells of some malignant oral tumors have a remarkable capacity to survive anoxia and metabolic arrest in vitro. After long periods in frozen condition, certain cell types in oral tumors retain their full productive vigor and malignant potentiality. The capacity of frozen tumor cells to survive appears to be limited to undifferentiated cells. Tumor cells capable of surviving undergo quickly a series of specific morphologic changes when subjected to low temperatures.

The fact that certain cells of a malignant oral tumor can survive long periods of experimental metabolic arrest offers an explanation of their demonstrated ability in vivo to resist separation from the primary growth until adequate capillary circulation is provided. This applies to the microscopic foci of isolated tumor cells which form the nuclei of metastatic growth or to groups of cells which become completely detached from the primary growth during the process of malignant infiltration.

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Secondary hyperparathyroidism and oral lesions

R. Domeck, R. C. Garobotte, J. Halpern, D. Hejman, E. Michael, E. Rosemblit and J. Winckler. *Parodontol.,Zürich* 12:66-74 June 1958

Sixteen patients with systemic diseases associated with secondary hyperparathyroidism were examined at the Dental School of the National University of Buenos Aires, Argentina. Four patients had cretinoid dysplasia; two patients had osteoporosis due to nutritional deficiencies; three had osteoporosis circumscripta cranii; four, kidney insufficiency; one, infantile scurvy (Barlow's disease); one, osteitis deformans (Paget's disease), and one, chronic intermittent aphthae.

In all patients, secondary hyperthyroidism was present. The serum calcium level was raised from 12 to 20 mg. per hundred milliliters; the serum phosphorus level was lowered to 2 mg.—in three instances even to 1 mg.—per hundred milliliters. Serum alkaline phosphatase was increased.

Osteoclastic resorption of bone occurred in various regions, principally in the spongiosa, and the resorbed regions were filled with new fibrous tissue. These histochemical and histopathological

changes resulted in an extreme softening of the osseous framework of the body. In three patients, however, bony apposition accompanied by redeposition of coarse osseous tissue was observed.

In all patients, these histochemical and histopathological alterations, obviously caused by the effect of the parathyroid oversecretion, appeared first in the upper jaw, in the retroalveolar spongiosa or the alveolar crest in the regions of the upper bicuspids and molars. Inflammatory reactions and degenerative disturbances of the periodontal membrane, the gingivae and the alveolar bone were evident.

In all instances, roentgenographic examinations proved to be insufficient to recognize the pathological changes in time or to indicate the manner in which these changes occurred and to determine the rapidity of the destructive process.

Only in a few instances was it possible to obtain biopsy specimens of the afflicted regions of the upper jaw to study the disease's progress. This was practically impossible to achieve in other bones.

Roentgenography may record adequately the gross skeletal changes which correspond to the underlying bone disease, but it is incapable of revealing pathological changes due to secondary hyperparathyroidism.

Arenales 2008, Buenos Aires, Argentina

Sarcomas of the soft tissues of the oral cavity: diagnosis and treatment

H. J. Betzler. *Medizinische* 7:257-262
Sept. 14, 1958

Soft tissue sarcomas, occurring in the oral cavity, are highly malignant tumors composed of cells derived from nonepithelial tissue, usually connective tissue. Some of these tumors are well differentiated and their cells resemble the parent (mesenchymal) tissue, but others are poorly differentiated and histologically their cells bear no resemblance to the particular cells from which they have arisen.

A review of 20 case histories, obtained from the Cancer Clinic of the University of Tübingen, Germany, revealed that among the 20 oral tumors there were 19 carcinomas and only one sarcoma.

Trauma has often been suggested as being the causative factor of soft tissue sarcoma but the evidence is not conclusive. Although case reports have been cited in which there has been a previous history of trauma, soft tissue sarcoma of the oral cavity is rare and—if it occurs—the patient usually is in the period of adolescence in which injuries to parts of the maxillofacial region are comparatively frequent.

The diagnosis of a soft tissue sarcoma in the oral cavity is difficult because the first clinical symptoms are observable after the tumor had developed. If a condition looks suspicious, an immediate biopsy is indicated. Contrary to common belief, biopsies do not promote metastases.

Treatment consists of radical excision combined with roentgenotherapy.

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Black hairy tongue

Hermann Mathis and Helmut Kruse.
Deut.zahnärztl.Zschr. 13:515-518
May 1, 1958

Pathoanatomically, black hairy tongue is a hypertrophy or hyperkeratosis of the filiform papillae which become elongated and thickened. Dark, furlike patches cover the dorsum with a hairlike projection. This comparatively harmless condition should not be mistaken for a type similar to the black tongue disease which is caused by vitamin deficiency or for the dark tongue which is usually due to a pigmentation without hypertrophy.

Bacteria seem to be of secondary etiologic importance although cultures have yielded streptococci, staphylococci, leptothrix and yeasts. These microorganisms may be governing factors in the greenish, brownish or blackish coloring of the affected tongue. Such discolorations, however, may be caused also by various foodstuffs or tissue reactions to medicaments taken orally and by tobacco smoke. Similar tissue reaction can be produced by iron absorbed by the tongue which is either present in the blood or derived from preparations.

Black hairy tongue generally occurs on parts of the dorsum, the most common location being

anterior to the vallate papillae. The filaments are either fine and short or long and coarse, but by no means always black. Occasionally, the entire dorsum of the tongue is covered with fine yellowish "hair." More common, however, are brownish-black, bluish-black or greenish furlike patches.

Microscopic examination of tissue specimens excised from black hairy tongues reveals an inflammatory reaction in the papillary layers of the corium similar to that occurring in leukoplakia. The filiform papillae appear hypertrophied and elongated because of retention of hornified cells that had failed to desquamate.

Treatment consists primarily of elimination of the causative agents after determination. Strict oral hygiene should be instituted. If yeasts are present, application of gentian violet is recommended. Thymol in a 1:1,000 solution or its isomer, carvacrol, is sometimes employed as an antiseptic to control molds. Strong escharotics, however, should be avoided because they may cause necrosis which invites infection.

In the surgical department of the Dental School of the Free University of Berlin, a 63 year old woman patient was seen in whom black hairy tongue probably had been caused by recently inserted acrylic dentures. The size of the hairy patches on the tongue varied from one-eighth to three-quarter inch in diameter. They were raised and formed a solid greenish-black surface with irregular edges. The acrylic dentures were removed, smoking completely stopped and hot and spiced food as well as alcoholic drinks prohibited. The patient was advised to pay special attention to oral hygiene and to diet. These steps arrested the condition and brought about a gradual disappearance of the symptoms. Surgical diathermy was contraindicated.

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Maternal rubella and dental defects

Hans Grahnén. *Odont.Revy* 9:181-192 July 1958 [in English]

Gregg (1941) found that rubella affecting women during the first three months of pregnancy can cause a number of developmental defects, including enamel hypoplasia, high caries incidence and delayed eruption of the deciduous teeth.

The aims of the present study were to establish if maternal rubella in Sweden causes clinically detectable enamel defects in the first or second dentition, and to find out if it causes any other specific tooth or jaw anomalies. Two groups of children were examined. The permanent dentition was examined in group A, composed of 31 deaf and dumb children between 9 and 14 years old whose deafness and dumbness were attributable to rubella. The deciduous dentition was examined in group B, composed of 21 children between three and five years old whose mothers had had rubella during pregnancy. All the children in group B were clinically healthy at the time of examination with the exception of one who had a congenital heart defect.

The results in both groups suggest that maternal rubella in Sweden does not give rise to any clinically detectable defects in either the deciduous or permanent dentition. A larger series of patients is necessary before any definite conclusion can be drawn as to whether maternal rubella causes dental defects.

Royal Dental School, Malmö S, Sweden

Enamel defects in the deciduous dentition of prematurely born children

Hans Grahnén and P. G. Larsson. *Odont.Revy* 9:193-204 July 1958 [in English]

Although medical literature contains reports of many investigations into the relationship between premature birth and somatic and mental abnormalities, little attention has been paid to the effects which premature birth may have on the development of the teeth and jaws. The present study was undertaken to determine whether a higher frequency of enamel defects, either hypoplasia or caries, exists in the deciduous dentition of prematurely born children (with a birth weight of less than 2,500 Gm.) as compared with the frequency in normal children (with a birth weight of at least 3,000 Gm.).

The subjects comprised a group of 68 premature children whose average age was five years three months, and a control group of 61 children of normal birth weight whose average age was five

years five months. The results were as follows:

1. The frequency of symmetrical enamel hypoplasia was significantly higher in the premature group than in the control group (21 per cent as compared with 2 per cent).

2. The upper teeth showed a greater incidence of hypoplasia, with the labial and buccal surfaces most commonly affected.

3. There was no relationship between enamel hypoplasia and the sex of the child.

4. No significant difference in caries incidence between the two groups could be found.

The increased incidence of enamel hypoplasia in the teeth of the prematurely born children supports the hypothesis that children with a birth weight lower than normal have a higher frequency of defects in enamel calcification than children with normal birth weight.

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Canker sores

T. F. McNair Scott and M. N. Crawford.
Pract.D.Monogr. 1-32 Sept. 1958

Among the synonyms used in describing lesions of the mouth that are usually ulcerative and recur are: acute aphthous stomatitis, vesicular stomatitis, maculofibrinous stomatitis, recurrent aphthous stomatitis, canker sore, dyspeptic ulcers, habitual solitary aphthous ulcer, Mikulicz's aphthae, periadenitis mucosa necrotica recurrens, ulcus neuroticum mucosae oris, and fragmentary Behçet's symptom-complex. Such a variety of names indicates so complete an ignorance of etiology that classification is impossible. Nevertheless, a certain number of mouth ulcers can be attributed to known etiologic factors, and others are associated with systemic diseases. Most mouth ulcers cannot be attributed to an exact etiology.

The usual canker sore starts as a small red area of inflammation beneath the mucous membrane of any part of the buccal mucosa; this increases in size and an ulcer appears. It may be small, involving only the epithelium, or may be large and extend into the submucosa, in which event scarring may result. The ulcers, which may be single or multiple, have an area of extreme congestion about them. In the average instance, the ulceration lasts about two weeks and then heals in the course of a week. There is no associated fever or regional lymphadenopathy. Pain is characteristic of these ulcers and may prevent the patient from eating during the height of the attack. Recurrence of the ulceration is common but the frequency of recurrence varies widely. In many patients, such recurrences are infrequent, but some unfortunate people experience an almost continuous recurrence of ulceration and healing, each cycle lasting about four weeks. The whole oral mucosa, including the tongue, fauces and pharynx, appears to be vulnerable, although the most common sites are opposite the molars in the maxilla, inside the upper and lower lips, and in the sulci. In addition to the mouth, the genitalia may be involved, fairly commonly in women (15 per cent) and rarely in men (2 per cent). The eyes also may be involved.

In a survey of 1,738 patients in the British Isles, the over-all incidence of canker sore was 19.3 per cent. The disorder was slightly more common in females (one in four) than in males (one in six).

The patient with canker sores presents to his physician or dentist a problem that is diagnostically baffling and therapeutically frustrating. Attempts must be made to establish the cause of the stomatitis, whether it be caused by infection, allergy, a systemic disease or traumatic procedure.

If the stomatitis is infectious and of viral origin, then therapy is clearly symptomatic. However, the importance of systemic supportive therapy, as required, cannot be overemphasized. Local therapy to promote cleanliness and to diminish pain should be instituted. Antibiotic therapy may be indicated to reduce secondary infection or primary bacterial infections. The possibility of allergy must be considered, since removal of the offending allergen will result in a clinical cure. It is important to recognize patients with the mouth manifestations of erythema multiforme, since steroid therapy often is beneficial. The presence of a chronic, severe, scarring, widespread mouth lesion should raise the possibility of fragmentary Behçet's syndrome, for which cortisone is not indicated.

The therapy of a stomatitis occurring in the course of a systemic disease depends on what is available for the associated disease. Sources of chronic trauma must be eliminated where found. Therapy of the unknown group of ulcers is highly unsatisfactory.

Because in 20 per cent of such patients, psychologic disturbances appear to be trigger mechanisms, it is wise to see if patients can recognize an associated disturbance of this sort. They should try to avoid those psychologic hazards when possible.

The relatively infrequent ulcer can be treated locally. Chlortetracycline hydrochloride as a 2.5 per cent suspension, in water, as a mouthwash or paint, appears to be the most efficient treatment available. The frequently recurring ulcers must as a rule be treated by supportive general therapy, local cleanliness and local anesthetics if the pain becomes intolerable.

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Herpes zoster

O. Oksala. *Nordisk Med.* 57:855-865 July 1958

Although herpes zoster frequently arises during the course of acute or chronic infections, occasionally after irradiations, many instances have been reported in which the disease occurred in persons who were apparently in good health.

A patient was observed at the Royal Dental School of Stockholm, Sweden, in whom herpes zoster developed seven days after the extraction of an upper cuspid.

Microscopic examination revealed the presence of eosinophilic inclusion bodies similar to but not related to the virus causing herpes simplex.

Constant pain followed the healing of the initial herpetic cutaneous eruption. The history of high temperature and eruptions along one branch of the trigeminal nerve assisted the diagnosis.

Treatment consisted of applying a dusting powder (zinc oxide and sulfathiazole) over the affected regions. The oral manifestations decreased after liver extract, vitamin B_{12} (cyanocobalamine) in large doses, and vitamin B_1 in smaller doses were administered.

The simultaneous occurrence of herpetic lesions in the maxillofacial region and the irritation of the trigeminal nerve affecting the facial skin and the oral mucosa (the latter probably due to anesthesia and complicated tooth extraction) do not necessarily constitute a defined relationship of cause and effect.

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Facial hemiatrophy: a case report

Nasib Singh Pathania and J. S. Guleria. *Punjab M.J.* 7:415-418 June 1958

The rare but classical disease of facial hemiatrophy (Romberg, 1846) is characterized by atrophy of one half of the face and usually involves all the tissues from the skin to the bones. The disease commonly starts during early life; sometimes it may be congenital. On record are a few patients in whom it started in middle or even old age. The etiology is uncertain, but among the various predisposing factors are trauma to the face, extraction of the teeth, injury to the brachial plexus, local infection near the jaw and pharynx, or an association with pulmonary tuberculosis, scleroderma, trigeminal nerve lesion and migraine.

A 25 year old man had suffered from pain in the abdomen and generalized weakness for six months. He was poorly nourished. His face looked asymmetrical. The skin on the left side was shrunken and wrinkled. Hair was distributed evenly over the scalp. Atrophy of the left half of the tongue, gingivae and palate were noticeable. The patient had no difficulty in controlling his tongue or in retracting the angles of the mouth. No other part of the body was atrophied. Roentgenograms showed evidence of atrophy of the left side of the mandible. The left maxillary antrum was less developed than the right. A blood count showed the patient to be anemic.

Facial hemiatrophy is so classical in its clinical picture that it hardly invites any differential diagnosis. The palate, tongue, pharynx, nose and ear often are involved on the affected side. The disorder causes no disability. The disease can become arrested at any time, but when it is progressive there is no known remedy.

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Public health dentistry

Fluorine content in the water sources of the Tatar and Mari Soviet Republics

E. T. Zemlyanitskaya.
Sborn.Nauch.Rab.Kaz.Gosud.M.Inst. 1:29-34
Jan. 1958

The fluoride content of the drinking water consumed by the populations of the Tatar and the Mari Soviet Socialist Republics was assayed, to determine whether conditions were present promoting the development of chronic endemic fluorosis and to clarify whether fluoride plays a role in the etiology and pathogenesis of endemic goiter.

Water from natural springs, water drawn from the Volga river and the water of several lakes, all used as drinking water, were analyzed.

In the Mari Republic, the water contained from 0.05 to 0.23 ppm fluoride, and in the Tatar Republic, from 0.10 to 0.60 ppm. This fluoride content is far below the optimum, and does not predispose to chronic endemic fluorosis. No evidence has been found that fluoride, and especially in such insignificant amounts, can play a role in the etiology or the pathogenesis of endemic goiter.

It was established, however, that the extremely low fluoride content in the drinking water of the Tatar and Mari Republics promotes an increased frequency of dental caries.

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The effect of 'trace elements' on experimental dental caries in the albino rat. I. A study of boron, copper, fluorine, manganese and molybdenum

B. J. Kruger. *Austral.D.J.* 3:236-247
Aug. 1958

An investigation was undertaken to see if five trace elements had any effect on dental caries in the molar of the albino rat. Suitable salts of the five elements in normal saline solution were administered as daily supplements during the period of enamel mineralization, in an attempt to incorporate them into the enamel structure and to impart to that enamel a resistance to caries. This resistance was measured by evaluating the caries produced in the first and second molars after a 20 week period on a caries-producing diet.

Of the five trace elements studied, boron, molybdenum and fluorine have been shown to reduce significantly rat molar caries. In one caries evaluation, copper was significantly effective and approached significance in another evaluation. Manganese was ineffective in reducing rat molar caries, and in fact tended to increase the carious attack.

A mixture of the salts of boron, copper, manganese and molybdenum (fluorine omitted) did not reduce dental caries.

A mixture of the salts of the five elements significantly reduced dental caries, but was not as effective as was sodium fluoride alone.

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Experimental caries with human foods

Ralph R. Steinman, Mervyn G. Hardinge and Robert W. Woods. *J.D.Res.* 37:865-873 Sept.-Oct. 1958

Three generations of caries-susceptible albino rats were fed eight different combinations of human foods. The diets employed represent the average American diet and modifications thereof, and were composed of human foods as customarily prepared and eaten. The foods were thoroughly mixed to make a uniform moist mass of rations which were fed to the animals ad libitum. The quantity of food mixture from individual food groups (basic ration, refined cereals, whole grain cereals, desserts, fruits, and fruits and vegetables) combined to make up the several diets was so proportioned as to keep the diets isocaloric, as well as to provide nearly equal intakes of carbohydrate and protein.

One hundred and seventeen weanling rats, 21 days old, were divided by litters into 9 groups of 13 animals each and placed on their respective diets. Similar groups and numbers of animals were employed for successive generations. Ten

weeks after weaning, three females and one male, generally littermates, were selected from each of the nine diet groups for breeding each generation. The animals remained on their respective diets throughout breeding, gestation and lactation. At the end of 16 weeks, the animals were sacrificed and the teeth examined for caries, the lesions being scored by the method of Shaw and others (1944).

The nutritional status of the animals from generation to generation was evaluated quantitatively by noting weaning weights, weekly gain, total weight, length of mandible, ability to reproduce and general physical appearance. The caries score and nutritional status were determined for each group of animals through successive generations.

In addition to the eight diets used, a modification of the synthetic diet of Sognnaes (1948) was fed to group IX as a control.

The nutritional status and physical well-being of all animals showed an inverse correlation with caries incidence. It would appear that with these diets, good nutritional status is associated with a low caries incidence, whereas nutritional deterioration is accompanied by an increase in caries.

The nutritional state of all animals at the beginning of the first generation was uniformly high. It was not until the beginning of the second generation that noticeable differences in weaning weights occurred. In four groups there was a steady decline in general nutritional status in the second and third generations. This physical deterioration was associated with a concomitant increase in caries.

The nutritional well-being of two groups degenerated between the first to the second generation with a corresponding increase in caries. These two groups adapted to their dietaries between the second and third generations with an improvement in their nutritional state associated with a decline in caries incidence.

The general physical well-being of the rats in two groups remained high and did not vary significantly during the three generations studied. Throughout this period, the caries incidence varied but little and remained low. In group IX, fed the standard cariogenic diet for comparative purposes, a constant and relatively high state of nutrition was maintained through successive generations. This constancy in physical well-being was accompanied by only minor fluctuations in caries incidence.

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Electron microscopic observations of the differences in the effects of stannous fluoride and sodium fluoride on dental enamel

John A. Gray, Henry C. Schweizer, Francis B. Rosevear and Robert W. Broge.
J.D. Res. 37:638-648 Aug. 1958

A study was made to determine the effects on whole enamel surfaces of treatments with aqueous solutions of stannous fluoride, sodium fluoride, and nonfluoride stannous salts, over a range of pH values, and the effects resulting from the exposure of these treated surfaces to acid buffer solutions.

Electron micrographs of replicas of enamel surfaces of human maxillary central incisors showed that stannous fluoride solutions produced no visible structural alteration, at pH values ranging from 3 to 7, and at concentrations between 0.02 and 0.4 weight per cent (from 50 to 1,000 ppm fluoride). These treated enamel surfaces showed no appreciable changes when subjected to acid buffer attack at a pH of 5 for five minutes, whereas an untreated surface showed extensive etching under the same conditions.

Enamel surfaces treated with sodium fluoride showed the typical formation of calcium fluoride crystals on the surface. As the pH of the solution decreased, this deposit formed more rapidly. The effects of an acid buffer on most of these surfaces were indeterminate because of the overlying layer of calcium fluoride. At a pH of 7, however, where the treatment times used were too short to yield a visible calcium fluoride layer, the results showed that no appreciable resistance to acid etching was imparted.

Nonfluoride stannous salts protected the enamel surface against the acid buffer action in a way which was indistinguishable qualitatively from the action of stannous fluoride, with the methods and technics described.

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School dental service in Czechoslovakia

J. Svejda and V. Ponková. *Zahnärztl.Praxis* 9:174 Aug. 1, 1958

The first half of the twentieth century brought the greatest advances in general public health ever experienced during any period in Czechoslovakian history.

Dental caries, malocclusions and hereditary clefts are by no means new as health problems; they have been known to every civilized generation of mankind. It is their significance as a general public health problem which is relatively new.

The most important dental problem is the increasing incidence of caries in preschool and school children. The Czechoslovakian public health authorities are not less aware than the dental profession that caries is the most extensive and also the most neglected dental condition. Data on the prevalence and incidence of caries in preschool and school children, however, are scattered and inadequate as far as previous decades are concerned.

Effective coordination between the dental profession and various governmental agencies resulted in a joint action to formulate a program for school dental service. This service was initiated in 1956 and has been maintained in most of the kindergartens and schools. It is supervised by staff members of the dental colleges and controlled by public health officers.

Prior to the initiation of the school dental health program, 16,000 preschool and school children underwent dental examination. The average child had 2.40 carious and 2.70 filled teeth. In about 95 per cent of the children, carious lesions of varying degrees were observed. From 25 to 30 per cent had malocclusions, and nearly 7 per cent, cleft lip, jaw or palate.

Early in 1958, these 16,000 children who had been more than two years under school dental care were re-examined. Twenty-seven per cent were free from caries, malocclusion or cleft and, therefore, did not need any dental treatment. Fifty-four per cent were under dental treatment. Only 19 per cent were untreated and in need of some kind of dental treatment.

The Czechoslovakian school dental service, which renders free dental care to all preschool and school children, functions well. The most urgent need is for an effective program of dental health education and public information. Parents and teachers must be made aware of the aspects of the dental problems still unsolved, mainly oral hygiene and voluntary periodic dental examinations. There is also a great need for continued and intensified dental research not only on the etiology of caries but also on caries prevention.

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Distribution of strontium in teeth from different geographic areas

Luville T. Steadman, Finn Brudevold and Frank A. Smith *J.A.D.A.* 57:340-344 Sept. 1958

Studies with radioactive materials have demonstrated that a calcifying tooth takes up more strontium than bones, but there has been no report on the actual concentration of strontium in tooth structure. A study was undertaken to provide such data. Because of a recently advanced theory that fluoride may act to increase the deposition of strontium in the body, a comparison of the concentration of fluoride and strontium in teeth from two areas with known amounts of fluoride in the water supply also was made.

Strontium was determined in the enamel and dentin from teeth from persons residing in various geographic areas. The following observations were made:

1. The concentration of strontium was similar in enamel and dentin of the same tooth.

2. The concentration of strontium was similar in enamel of unerupted and erupted teeth of persons of different ages from the same area.

3. The strontium concentration varied considerably in teeth of persons residing in different geographic areas.

4. Strontium is deposited primarily before eruption, during tooth calcification, but additional strontium is laid down in the secondary dentin and cementum formed posteruptively. It follows that children are most likely to have appreciable amounts of strontium deposited in the teeth in the event of atomic fallouts. By far the greater portion of strontium will be retained permanently. Inasmuch as strontium has a half-life of 25 years,

deposition of strontium in a permanent tooth of a child is apt to result in radiation throughout the life span of the tooth.

5. Fluoride in drinking water does not affect the deposition of strontium. The acquisition of these two trace elements by calcified structures appears to be independent and unrelated. For example, teeth of Greenlanders with the highest concentration of strontium were from an area of low fluoride concentration, and teeth from persons residing in Post, Texas (high fluoride concentration) and Augusta, Maine (traces of fluoride) had similar concentrations of strontium.

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Freedom from caries: case report

H. R. Sullivan. *School D.Serv.Gaz.,New Zealand* 18:20-21 May 1958

The author recently examined the mouths of two sisters, 13 and 15 years old; both were completely free of dental caries.

The family had a history of sensitivity to sugar. The sensitivity became obvious in both children, and greatly affected their dietary regime. The elder daughter from the age of nine months tended to develop hives when she ate sugar. The younger daughter was affected to an even greater degree, from the time of birth; her health was poor until it was found that she could tolerate soy bean flour which, with skim milk and added vitamins, ultimately formed the basis of her diet. Some vegetables also were tolerated.

By the time the two children reached the age of six years, they could tolerate fats and sugar in a restricted amount; since that age, their diet gradually has been broadened. At no period have they eaten an excess of cakes, pastries, jams, confections or soft drinks, but they have eaten white bread since the age of six years, and have taken sugar cooked in foods, on porridge, in milk puddings and in homemade ice cream. Occasionally the elder daughter develops a transient desire for sweet food and may eat a quantity of honey for a short period, whereas the younger daughter sometimes eats dates and raisins in greater quantities than usual. However, the main diet consists of savory rather than sweet substances, although no parental restrictions are placed on the children's choice of foods. Neither sister has paid great attention to oral hygiene.

The mouths of both children are free of caries. The elder sister has all teeth in good occlusion, except that the third molars are unerupted. The younger sister still retains her deciduous second molars. Two lactobacillus counts for the elder sister give figures of 10,850 and 38,000 lactobacilli per milliliter of saliva, respectively. The counts for the younger sister were nought on one occasion and 27 lactobacilli per milliliter of saliva on another.

The freedom from caries in these two sisters appears to have been brought about by an early enforced abstinence from refined carbohydrates. From this abstinence has developed a dietary pattern in which refined carbohydrates are used only in small amounts. Further, this carbohydrate is consumed mainly at mealtimes in conjunction with other foods.

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The distribution of lactobacillus species in northern and southern Italian communities

A. C. Baird-Parker, K. A. Bisset and E. B. Pike. *Brit.D.J.* 105:137 Aug. 19, 1958

In continuation of the studies reported by Hayward and Davis (1956) on the distribution of lactobacilli in a Roman population, a comparison has been made, in the same manner, between two groups of Italians in Pavia and in Naples. The subjects were patients in public health institutes. In Pavia, where the standard of living is high, 11 of 44 subjects tested were caries-free. In Naples, caries-free subjects were rare.

Mouths free of lactobacilli were so rare as to be negligible statistically, but there was a significant difference between the high and low caries groups. The low caries group in Pavia had a 30 per cent incidence of *Lactobacillus fermenti* compared with an incidence of 50 per cent of this microorganism in the Naples subjects. This species was not isolated from any of the normal, caries-free mouths examined, in which, by contrast, *L. casei* usually were present.

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Diets of Central Americans and their possible relation to dental health

Marina Flores. *Rev.dent.,El Salvador* 3:3-7 Oct.-Nov.-Dec. 1957

Although the relation between diet and dental caries is still controversial, laboratory and epidemiological studies suggest that diet is one of the determining factors in dental caries.

A study reveals that the diets of rural and urban families in the various countries of Central America are similar. The diet in rural areas in all the countries is monotonous. Breakfast consists of corn tortillas, beans and sweet coffee. Luncheon consists of the same food, plus vegetables and an occasional slice of meat. The ingredients for dinner seldom differ from those consumed at breakfast.

The quality and quantity of vegetables and fruits that are added to this diet vary according to the geographic and social situation of the community.

Animal derivatives, such as meat, milk and eggs, seldom are consumed.

An important dietary factor for dental health is corn, because of its high percentage of calcium. The corn used in tortillas is boiled in lime water. The grain is not refined.

Less corn is consumed in Costa Rica and Southern Nicaragua, the form of lime is different, and the ingestion of calcium is less in these regions. This dietary lack is counteracted with a higher consumption of milk products, but families at the lowest economic level cannot afford milk dishes.

Sugar consumption is closely related to caries. In all the urban areas, white sugar is consumed, whereas in the rural areas nonrefined sugar (brown sugar) is eaten. Sugar consumption is highest in Costa Rica. Families in El Salvador and Nicaragua consume only a fourth of the amount of sugar consumed by families in Costa Rica.

Families in Guatemala consume relatively high levels of calories, calcium, thiamine and niacin, because of the large consumption of corn. The consumption of vitamin A also is highest in Guatemala, this vitamin being found in the vegetables and yellow corn eaten by the Indians.

The level of protein consumption is below average in El Salvador and Costa Rica. In Costa Rica, the average diet is deficient in thiamine, niacin, vitamin A and riboflavin. Consumption of vitamin C is lowest in Nicaragua.

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Sweet tooth and decay

Editorial. *Brit.M.J.* No. 5091:293-294 Aug. 2, 1958

In one African tribe an attack of dental caries is considered sufficient grounds for divorce. If one of the children has decayed teeth, he is forbidden to feed from the family pot. Under such rules almost all the marriages in Great Britain would be broken and all but a few children would eat alone, for the incidence of dental caries in Great Britain is so great that scarcely have the teeth erupted before their destruction begins. On the average, a four year old child has at least four decayed teeth; each year through childhood one or two teeth are added to the total number affected. It surprises no one that the dental profession, now entering the lean years of manpower shortage, is unable to restore more than a small fraction of the children and adolescents to dental health.

There are three main lines of approach to the prevention of dental caries: (1) the elimination or inhibition of bacterial activity; (2) the removal of the substrate, and (3) the increase of tooth resistance to attack. All these are being investigated; provision for optimum fluoride intake during tooth development is one example of a method by which resistance to caries can be increased.

Enough facts are known on which to base helpful guidance in prevention. At the 1958 Congress of the Royal Society of Health, the following simple rules for the maintenance of dental health were given: (1) no eating or drinking between meals; (2) regular mealtimes; a planned diet which allows the eating of chocolate and other sweetmeats only at table; the eating of fibrous fruits or vegetables such as apples or carrots at the end of meals to aid physiological cleansing of teeth; (3) the encouragement of children by example and instruction to use the bubble and swal-

low technic of rinsing the mouth with plain water three times after eating and drinking, and (4) instruction of young children in oral hygiene by parents and teachers showing the value of brushing the teeth, especially last thing at night.

When families are able to keep to these rules, the children remain free of caries. It is important to intercept dental caries in its earliest stages by dental treatment. The need for education in dental health on a national scale is generally admitted, and the McNair Report [on recruitment to the dental profession] (1956) makes a recommendation to this effect which deserves to bear fruit.

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Caries-producing potential of chocolate

William S. Mueller. *J.A.M.A.* 168:436
Sept. 27, 1958

It is a general belief that high acid production in dental plaque is one of the major causes of caries. A recent study (Ludwig and Bibby, 1957) on the production of acids in dental plaque after the ingestion of various solid and liquid foods showed that milk chocolate produced the most acid. It was also found that the amount of acid does not depend solely on the carbohydrate content of the food or on the amount of food retained in the mouth.

A bacteriological study of chocolate milk (Fuller, Mueller and Swanson, 1942) gives data which presumably could serve as a possible explanation for the high acid production in the mouth after chocolate is eaten. From that investigation it was concluded that cocoa powders or chocolate syrups added to milk inhibited the growth of bacteria likely to be found in milk, with the exception of *Streptococcus lactis*. Furthermore, it was concluded that the tannic substances of cacao products are the agents responsible for inhibiting bacterial growth.

Mueller and Kuzmeski (1944) analyzed 18 samples of commercial cocoa powder for tanninlike substances and found values ranging from 2.6 to 15.6 per cent. Although milk chocolate was not analyzed for tanninlike substances, calculated amounts are from 1 to 2 per cent, depending on the milk chocolate formulation.

In the light of such results, one would expect milk chocolate to produce a greater amount of acid than many other foods commonly consumed. Any inhibition of nonacid producing microorganisms by tanninlike substances should increase the growth of acid producers because of lack of competition.

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Frequency of dental caries in the deciduous and permanent molars of Czechoslovakian school children

J. Miksa. *Rev.mens.suisse odont.*
68:810-815 Sept. 1958

The teeth of 5,160 Czechoslovakian school children, 2,614 boys and 2,546 girls from 6 to 15 years old who were born and raised in the rural districts of Bohemia, were examined and the findings statistically recorded on dental charts at the Stomatological Clinic of the University of Prague.

Although practically every child showed carious lesions in at least one tooth, study of the dental charts revealed a specific predisposition to caries in the first and second molars. No significant difference existed between boys and girls in regard to caries frequency.

The caries frequency in the upper first molars varied from 76 per cent (in six year old boys) to 100 per cent (in nine year old girls).

The caries frequency in the lower first molars varied from 58.6 per cent (in six year old boys) to 100 per cent (in nine year old girls).

The caries frequency in the upper second molars varied from 5.1 per cent (in ten year old girls) to 93 per cent (in 15 year old boys).

The caries frequency in the lower second molars varied from 2.3 per cent (in ten year old girls) to 96.3 per cent (in 15 year old boys).

The incidence of caries, however, seemed to differ significantly among the districts and communities.

Fewer carious lesions were observed in children who were born during or immediately after World War II than in the children born during the later postwar period.

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Oral health survey of 29,550 Kansas City, Missouri, elementary school children

Jack E. Wells, John Copeland, Wm. J. Carter and George H. Coe. *J.Missouri D.A.* 38:8-15 Oct. 1958

The dental health condition of 29,550 colored and white elementary school children of Kansas City was determined by examination.

The percentage of those needing dental care of deciduous teeth ranged from 89 per cent of the 8 and 9 year old children to 20 per cent of the 12 year old children. The average number of def teeth ranged from 5.79 at age 6 to 0.58 at age 12.

The percentage of those needing dental care of permanent teeth ranged from 51 per cent of the six year old children to 95 per cent of the ten year old children. The average number of DMF teeth ranged from 1.44 at age 6 to 6.44 at age 12.

The incidence of malocclusion increased as the age of the children advanced from 6 to 12 years. There was little difference in the incidence of malocclusion between the two sexes, except in the 12 year old group in which malocclusion was slightly higher in boys than in girls. The percentage of malocclusion ranged from 18 per cent in the 6 year old group to 36 per cent in the 12 year old group.

The extent of good oral hygiene remained fairly constant up to the 11 year old girls. The 11 and 12 year old girls showed a decided advantage in good oral hygiene over the boys at the same age. The boys consistently had a higher percentage of poor oral hygiene at each age level.

The over-all age-adjusted number of DMF teeth for the white children was 3.49, and for the colored children, 3.65. The difference is not significant. The over-all adjusted number of def teeth for the white children was 3.83, and for the colored children, 3.74. Again, the difference is not significant.

It was concluded that the trends in dental caries experience (DMF) were the same for white and colored children, and that there was no difference in the rate of increase of dental caries experience for each race throughout the age range studied. The number of filled teeth, however, was much lower in colored than in white children for all ages.

Much less than 20 per cent of all decayed deciduous and permanent teeth were being filled in the children of each age group. The proportion of decay being treated in children six and seven years old was less than 10 per cent. The situation points up the urgent need for water fluoridation and for increasing the dental facilities for the treatment of children in Kansas City.

School of Dentistry, University of Kansas City, Kansas City, Mo.

The preaching and practice of oral hygiene

Geoffrey L. Slack and Sidney Haynes. *Brit.D.J.* 104:171-172 March 4, 1958

An inquiry was undertaken at a certain university and dental hospital to find out current practices in oral hygiene among the qualified staff and students. The 122 subjects were divided into four categories: 31 geography students; 33 dental students in their clinical years; 36 preclinical dental students, and 22 full-time members of the dental staff.

Sixty-four of the 122 subjects brushed their teeth twice each day; 30 brushed once; 23 brushed three times, and 5 brushed after all meals and after snacks. Of the 22 dental staff members, none brushed after all meals, 5 brushed three times a day, 14 brushed twice a day, and 3 brushed once.

Of the 22 dental staff members, 8 brushed before breakfast, 13 brushed after breakfast, 1 brushed after the midday meal, none after the evening meal, and all 22 before retiring.

Twenty-eight of the 122 subjects indicated no preference as to tooth paste; 25 preferred Gibbs S.R., 18 preferred Colgate and 16 preferred Macleans. The dental staff seemed to use whatever paste was available as samples from the makers.

The questions on dietary habits did not reveal any points of interest, though a number of subjects had as many as seven "meals" each day. The eating of chocolates and sweets was confined generally to the afternoon and evening; the students claimed that sweets aided their concentration during their studies. One third of the dental staff were nonsmokers.

If the observations of this small inquiry are representative, the problem of dental health edu-

cation is shown in its true light. It is unrealistic to expect the general public to go to greater lengths to attain dental health than do the members of the dental profession. The disappointing fact that emerges is that the dentist himself considers that the effort of toothbrushing after every meal is out of proportion to the benefit obtained.

School of Dental Surgery, University of Liverpool, Liverpool, England

Lactobacilli and Streptococcus salivarius in saliva: a preliminary report

Alan H. Cohen and Albert A. Collins. *Austral.D.J.* 3:230-235 Aug. 1958

A project was undertaken to try to determine the relationship which exists between *Streptococcus salivarius* (a common oral streptococcus) and dental caries, and between *Str. salivarius* and oral lactobacilli in saliva. This preliminary survey is concerned with establishing technics and base line data for the future studies.

The survey group consisted of 20 young men chosen at random from the third-year class at the University of Otago Dental School. Paraffin-stimulated saliva was collected in a sterile screw-capped jar from each of the 20 subjects on rising and at 1. P.M. and 4 P.M. of the same day. In addition, early morning fasting samples were collected from the same group on three consecutive days as well as on the same day for three consecutive weeks.

Lactobacilli counts were done on tomato yeast culture medium as described by Shroff and Madden (1948). The selective medium used was essentially the same as that of Williams and Hirsch (1950). The plates were incubated at 37°C. for 48 hours and the number of colonies determined.

The number of colonies of lactobacilli ranged from 0 to over 1,000,000 per cubic centimeter of saliva. The number of colonies of *Str. salivarius* ranged from a low of 4,000,000 to a high of 4,800,000,000 colonies per cubic centimeter of saliva.

It was noted, particularly with the *Str. salivarius,* that an appreciable variance in results occurs from day to day, from week to week, and during a single day. As might be expected, the greatest differential exists between results obtained at different times on the same day, the highest counts generally being found in the early morning specimens.

Although the number of subjects used for the preliminary study is small, the possibility appears to exist that there is a direct relationship between the two types of organisms studied, particularly in those subjects exhibiting a very high or a very low colony count.

Dental School, University of Otago, Box 647, Dunedin, New Zealand

Sweet tooth and decay

R. B. D. Stocker. *Brit.M.J.* No 5094:510 Aug. 23, 1958

Acid drinks are not cariogenic. Such acids stimulate salivation and therefore may have a protective effect.

To condemn round-the-clock eating of all carbohydrate foods as causing tooth decay is too sweeping. Untreated vegetables and fruit, except bananas, can be exonerated. There is little evidence that eating rice, macaroni or cooked whole vegetables will cause caries. Chewing gum, like sugar cane and other fibrous foods, may be even beneficial to the teeth. Sorbitol is a sweet carbohydrate that does not readily ferment; sweets made from it are advertised in THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION and sold with the claim "safe for teeth." The foods to be condemned are those which leave deposits of concentrated starch or sugars, or sugars in solution, stagnating in the mouth after eating.

Confectionery frequently consumed is likely to remain popular despite all educational effort. Is it necessary, however, that it should lack such qualities of texture, consistency and content of roughage and water as render other fermentable carbohydrate foods not only wholesome but succulent? Is it not conceivable that "texturization" of confectionery could restore the originally natural conformity between what tastes good and what is beneficial. Such an invention to make popular food more wholesome, together with fluoridation of drinking water, might bring caries immunity to the masses whose appetites triumph over prudence.

73 Harcourt Terrace, London S.W.10, England

Therapeutics

Sjögren's syndrome treated with ACTH

K. J. Gurling, R. S. Bruce-Pearson and M. H. Pond. *Brit.J.Ophthal.* 42:619-625 Oct. 1958

Sjögren's syndrome, the symptom complex described by Tage Anton Ultimus Sjögren, a Swedish surgeon, in 1933, consists of dryness of all mucous membranes, especially xerostomia, enlargement and dysfunction of the salivary glands, especially the parotid gland, and polyarthritis, sometimes involving the temporomandibular joint.

The syndrome is of unknown etiology, and among the various factors suggested are endocrine insufficiency, increased sensitization to undetermined allergens and virus infection.

The initial symptoms are burning sensations in the oral cavity and the eyes, and decreased salivary secretion which is followed by mucous discharges. Later atrophic changes occur in the oral mucosa which becomes smooth and shiny. On the tongue extreme flattening of the filiform papillae is observed.

Six middle-aged women with Sjögren's disease were treated with adrenocorticotropic hormone (ACTH) in doses of from 1 to 2.4 Gm. daily; three patients also received cortisone topically applied.

The treatment obtained no significant improvement of the salivary gland function, keratoconjunctivitis and xerostomia. Slight symptomatic ameliorations observed in some of the patients were only temporary and were not greater than those occasionally appearing in untreated patients.

In two patients, however, there was a definite reduction in size of the parotid gland, indicating some favorable influence of ACTH on the lymphoid infiltration which had caused the swelling. This improvement was not accompanied by restoration of the secretory function of the salivary glands.

In biopsy specimens, taken from all six patients, some microscopically normal gland parenchyma was present in amounts which were related inversely to the degree of parotid swelling and the dysfunction in salivation. Two of the patients with arthritis of the temporomandibular joint were relieved of pain. It can be assumed that the arthritic lesions of the joint differed in origin from the lesions in the salivary glands and in other epithelial surfaces.

The significant increase in the urinary 17-ketosteroid excretion, the gain in weight and the decrease in eosinopenia observed in all six patients demonstrated that ACTH used in this test treatment provided adequate stimulation of the adrenocortical system.

All patients have since been followed up for more than one year, but in none has Sjögren's syndrome undergone any significant modification.

Tavistock Square, London W. C. 1, England

Vitamin B_{12} in the treatment of trigeminal neuralgia

Carlos Eduardo Bozzini. *Rev.A.odont.Argentina* 46:141-151 May 1958

Because trigeminal neuralgia is one of the most distressing and pain-producing conditions, involving the gasserian ganglion and the root and branches of the fifth cranial (trigeminal) nerve, it has been widely studied and many different treatment methods have been suggested. None of these, however, is completely satisfactory.

Vitamin B_{12} therapy, a comparatively new treatment method, has proved to be effective in 75 per cent of patients with trigeminal neuralgia. Comparatively large doses (1 mg. per cubic centimeter) are administered. One dose should be injected intramuscularly every day for at least 15 days. Most patients experience increased pain between the third and sixth day. This fact has often caused a premature abandonment of vitamin B_{12} therapy. If a satisfactory result has not been obtained after 15 days, the treatment should be repeated. In the author's clinical studies, some patients have received 60 consecutive injections without developing intolerance.

In patients in whom the response to vitamin B_{12} therapy is favorable, the paroxysmal pain extending along the course of the trigeminal nerve disappears during the 15 day treatment period. In a few patients, pronounced paresthesia persisted in the involved regions but in no patient were the perverted pain sensations excited by stimulations of trigger points. By repeating the vitamin B_{12} therapy, the symptoms of paresthesia disappeared.

Complete relief of the neuralgic pain was obtained in patients in whom no surgical procedures were performed. The results of vitamin B_{12} therapy in patients who underwent intercranial operations of trigeminal tractotomy was less favorable.

Prolonged remissions of trigeminal neuralgia are not uncommon; but because these abatements of symptoms occur only in the early stages of trigeminal neuralgia—and the author's patients had had the disease for several years—the favorable results obtained by vitamin B_{12} therapy cannot be attributed to such spontaneous remissions.

The most convincing proof of success was the fact that the patients—even if the paroxysmal pain had not disappeared completely—refused other treatment methods and were able to move all facial muscles without fearing an attack.

Although the mechanism by which vitamin B_{12} acts to overcome the pain associated with trigeminal neuralgia is difficult to explain, this mechanism certainly is not connected with relief of any vitamin deficiency, because the doses used are far in excess of the body's requirements. The curative action of vitamin B_{12} probably is due to some as yet undetermined therapeutic property.

Whatever the explanation may be, the results obtained by vitamin B_{12} treatment of trigeminal neuralgia are so favorable that the author suggests this treatment method be tried before other measures such as alcohol injections or various surgical interventions. These procedures should be kept in reserve for patients in whom vitamin B_{12} therapy has failed.

Montevideo 646, Primer Piso, Departamento D, Buenos Aires, Argentina

Applicability of nitrofurazone in dental practice

Ulrich Berger. *Schweiz.Mschr.Zahnhk.* 68:783-795 Sept. 1958

Nitrofurazone's spectrum of action extends over almost all pathogenic microorganisms found in the oral cavity. Some of the pneumococci, enterococci, *Pseudomonas pyocyanea* and a few of the spore-forming anaerobes and fungi become resistant to repeated topical application of nitrofurazone. In vitro it was difficult to develop bacterial strains that were resistant to this antibacterial compound. When such resistance occurred, it appeared to be of a relatively low degree.

Cross resistance has been observed to some other nitrofurans but not to nitrofurazone, and also not to combinations of nitrofurazone and the antibiotics or sulfonamides used in dental practice. In isolated instances, prolonged exposure to these compounds produced sensitization.

Nitrofurazone is bacteriostatic in broth concentrations of from 1:100,000 to 1:200,000, and bactericidal in concentrations of from 1:50,000 to 1:75,000.

In animal experiments, nitrofurazone has proved to be effective against a variety of gram-negative and gram-positive bacteria.

In investigations carried out with human adults, nitrofurazone, topically applied, was effective in the prevention of mixed infections, and as an adjunct to oral surgery in the preparation of areas for operations (especially removal of foreign bodies).

Systemic toxicity is comparatively insignificant, and allergization is nonexistent.

For topical application, from 0.5 cc. to 0.8 cc. of a 0.2 per cent solution may be used three or four times daily. The application, however, should be preceded by irrigating and drying the area. Occasionally, infection of the oral mucosa occurred, especially if hemolytic streptococci appeared during treatment.

Dental Clinic of the University of Hamburg, Germany

General

Extractionism?

Dona Z. Meilach. *Mediarts* 1:10-13
Sept. 1958

Thousands of visitors at international art exhibitions have viewed the paintings of David Solot, a successful French dentist and artist. [Reproductions of Solot's paintings have appeared in previous issues of DENTAL ABSTRACTS.] The observer probably visualizes dentistry with a new and more pleasant feeling, because Solot uses the environment of his office, teeth and dental instruments as poetic inspirations.

The unique surrealistic paintings have gained international recognition. In France, where he has had several exhibits, the critics almost unanimously applaud his themes, approach, originality and technic.

In the United States, the Lederle Laboratories Division of the American Cyanamid Company, Pearl River, N. Y., included small reproductions of Solot's paintings in direct mail brochures sent to dentists, and reproduced four selected paintings in original colors to satisfy the demands of many dentists who requested them.

David Solot had been interested in art when he was a dental student, but the study of dentistry was so demanding that he did not find time and opportunity to pursue art. Later, as a young dentist with a growing practice and family, Solot found little leisure time.

The turning point in Solot's life arrived in 1940 when he was 30 years old and a prisoner of war. During the long hours of captivity, he found time to reflect, to revaluate the meaning of his previous activities. He decided that if ever he should return to civilian life and dental practice, he would dedicate his leisure hours to painting.

For several years after the war, he painted still lifes hardly different from the subjects painted by other young artists. During the annual session of the French Medical Association, an art exhibition was arranged in which physicians and dentists (among them Solot) showed etchings, paintings and sculptures. Solot observed that not one of these professional men presented an art work which was inspired by medicine or dentistry.

In 1950, Solot first exhibited several surrealistic paintings motivated by instruments he used routinely in his practice. The initial reaction from critics, dentists and the general public was extremely encouraging and gratifying.

Human teeth, angles, bottles, broaches, burs, chisels, clamps, clasps, forceps, pincers and many other dental items appeared to him so alive and full of expression and movement that he trans-

David Solot and his painting "Don Quixote"

"Flowers of Evil"

"Crucifixion"

posed them into a creative art which he called "extractionism."

The fact that David Solot does not have to make a living by selling his paintings permits him to follow his unique imagination. He attempts to bring beauty and poetry into a profession so often unjustly feared.

"Who can have bad feelings about dentistry," he asks, "if one realizes the humor, color and movement inherent to teeth and the dental instruments which unfortunately too often are regarded as causative factors in the appearance of feared pain?"

9735 South Vanderpoel Ave., Chicago 43, Ill.

Dental materials advertising

Dioracy Fonterrada Vieira.
Rev.brasil.odont. 15:343-353
Nov.-Dec. 1957

From a study of the advertising used by the manufacturers of dental materials, one can evaluate the cultural level of the dental profession in a given country, the state of the dental materials industry, and the interest of the government in the dental products being sold.

To the informed dentist, aware of the indications for and the limitations of the various products, it would be useless to advertise items as panaceas. In the United States, dental materials are evaluated by the dental research section of the National Bureau of Standards, in cooperation with the American Dental Association. Manufacturers take pride in announcing that their products are "accepted" by the American Dental Association.

In countries where science is at a low level, or where government is disinterested in the public's health, dental materials may be marketed with extravagant claims. Such advertising may be effective, but it is harmful in that it fails to describe accurately or evaluate properly the products being presented.

In Brazil today, some advertising literature attributes to cobalt-molybdenum casting alloys exceptional properties, such as high flexibility, improvement of the patient's sense of taste, and vast esthetic properties. Manufacturers of some silicate cements assert that their products do not harm pulpal tissue, and that in deep cavities it is unnecessary to utilize zinc oxide-eugenol cements as a base under the fillings.

Some manufacturers of acrylic resins affirm that their products have no porosity at all, that structural changes are "controlled" during polymerization, and that their self-curing acrylic resins are recommended for all classes of direct restorations.

Some manufacturers of hydrocolloids affirm that impressions made with their products do not change dimensionally with the passage of time. A manufacturer of a casting investment announces that the specifications of his product are superior to those set forth by the American Dental Association. Some amalgam alloys offered to dentists are

being enriched with gold, which does not influence the physical properties of the alloy and results only in an increase in price. Literature supplied with certain zinc cements is confusing as to temperatures and spatulation times.

For patients, for dentists, and for dental product manufacturers it is important that satisfactory products be produced, and that the advertising and publicity for such products be a true guide to the quality of the goods offered and explain their use.

Faculdade de Farmácia e Odontologia, University of São Paulo, São Paulo, Brazil

Specification and standardization

A. R. Docking. *Internat.D.J.* 8:240-242 June 1958

There are several varieties of published specifications for dental materials. There are the specifications sponsored by a government and used chiefly in connection with purchasing by government departments and by such organizations as the armed forces, hospitals and social services.

Another type of specification includes those published by national standards organizations which may operate independently of governmental control. As their use is essentially on a voluntary basis, such specifications neither prevent the manufacture of inferior products nor their use by the dentist. However, by encouraging the adoption of specifications by manufacturers and by educating dentists to select and use products which meet their requirements, a standards organization can do much to improve the quality of dental materials and instruments.

Since 1947, Australia has been active in regard to this type of dental standard. From 1951 to 1955, standards have been published by the Standards Association of Australia for impression and laboratory plasters, artificial stone, modeling compound, silicate cement, wrought gold, inlay and denture casting golds, and casting and sticky waxes.

The British Standards Institution has prepared specifications for denture acrylic resin and dental x-ray film. South Africa has been interested in a specification for synthetic resin teeth. The German Standards Committee recently has embarked on a series of standards covering dental materials in general, filling materials and cements in particular.

A third type of specification is that sponsored by some particular group or organization, such as that of the American Dental Association.

The latest type of specification is the international dental standard. A resolution of the International Dental Congress in London in 1952 provided for appointment of a Subcommittee on the Standardization of Dental Materials, with members from seven countries. Progress has been made by the Subcommittee in preparing specifications on dental amalgam alloy and mercury.

The outstanding example of standardization is that of the American Dental Association with its program of Certified Dental Materials. The Australian Dental Association has inaugurated an accreditation program along similar lines. In Switzerland the Swiss dental society in 1951 initiated a bureau for the control of dental materials.

By the introduction of specifications for dental materials and their standardization through accreditation programs, the quality of dental materials has steadily risen, and will continue to do so with further refinements in manufacturing, testing and clinical technics.

Commonwealth Bureau of Dental Standards, Melbourne, Australia

New material for somato-prosthesis

George W. Barnhart and John E. Robinson. *J.D.Res.* 37:948 Sept.-Oct. 1958

A new material for the construction of prosthetic appliances for the correction of surgical and other deformities of the intraoral region has been developed. It consists of a combination of silicone rubber (Silastic R.T.V. 501, available from Dow Corning Corp., Midland, Mich.) and various methyl methacrylate powders used to tint regular acrylic denture base material, in conjunction with a self-curing acrylic liquid and hydroquinone. This base material has a good quality of flow during processing, and reproduces tissue colorings well. The proper depth of coloring of specific areas is achieved by first lining the mold with a thin layer of untinted base material. Then colored acrylic powders are sprinkled over this in the

indicated areas, and the bulk of the appliance is filled with untinted base material. Polymerization is accomplished in a stone mold at room temperature for from 18 to 40 hours, depending on the bulk of the prosthesis.

The material possesses the following desirable qualities: flexibility; dimensional stability; can be cemented to human skin with cosmetic adhesives; can be colored so that it reproduces accurately the appearance of human tissue; a texture that closely simulates that of skin, and can be molded with standard dental laboratory technics to any form required.

Zoller Memorial Dental Clinic, University of Chicago, Chicago 37, Ill.

Dental observations made while wintering in Antarctica, 1956–1957

David Knoedler and William Stanmeyer. *J.D.Res.* 37:614-622 Aug. 1958

A dentist was assigned to the group of 92 men who constituted the wintering-over party of the United States in Antarctica during the winter of 1956 for the International Geophysical Year studies. Of 92 men, 89 sought the dentist's aid during the year's stay.

Odontalgia as a result of thermal conductivity through metallic restorations that lacked or had insufficient intermediate cement bases was a common dental complaint. The condition was controlled by replacing the restoration and supplying the tooth with an adequate insulating cement base.

Hypersensitive cervical dentin also was a common complaint. It was controlled through the use of silver nitrate; if such a conservative measure failed, a cavity was prepared and an insulated filling placed. Restorations placed with standard methods were easily tolerated and remained intact.

Loss of restorations through the action of the Antarctic cold did not prove to be a problem. No marginal leakage was observed through contraction. Those restorations that fell out did so because of some pre-existing condition such as secondary decay, undermined enamel or trauma.

Given the facilities and time, oral hygiene remained good. Generalized periodontal trouble was not a problem. Two instances of general inflammation of the soft tissues were attributed to long hours of exhaustive work at low temperatures.

Aphthous stomatitis appeared in about 10 per cent of the personnel. Treatment consisted of a mild astringent applied to the lesion as early as possible. No further treatment was considered necessary, and complete healing usually was effected in from seven to ten days. The rate of deposition of dental calculus did not appear to be unusual or to change from what would be expected of the same individual living in the United States.

Alveolar osteitis appeared after 10 of the 44 extractions, an average of 22.73 per cent, as compared with an average of 0.9 per cent reported at the University of Pittsburgh School of Dentistry in a study of 23,886 extractions. Extractions in Antarctica were done under generally accepted procedures of sterility. The exposure of the patient to the severe cold during the healing process may have been the inciting cause for "dry socket."

Shock after the injection of a local anesthetic containing epinephrine was never a problem. Two instances of syncope occurred in 250 administrations of anesthetic, but these could not be correlated with the increased levels of epinephrine in the blood and were not reproduced in subsequent visits.

U.S. Naval Submarine Base, New London, Conn.

Titanium, a future material for prosthetic dentistry

Georges Nicolas. *Méd.& Hyg.* 16:420-421 Sept. 10, 1958

The low thermal conductivity of titanium, and its ability to withstand corrosive action, suggest that this metal and its alloys may become valuable materials in prosthetic dentistry.

The metallic element titanium was discovered by William Gregor in 1789. The German chemist, M. H. Klaproth, rediscovered it in 1797 and created the name titanium after the Titans of Greek mythology who possessed superhuman strength.

Titanium dioxide in combination with synthetic resins is used in the production of cars,

refrigerators, washing machines, cabinets and so forth. It is also employed extensively by the rubber, linoleum, leather, ink, dye, cosmetic, paper and ceramic industries.

Commercially, 99.5 per cent pure titanium is available in the form of sheets, strips, plates, bars, tubings and wires.

Several authors have suggested that titanium and its alloys (ferro-carbon-titanium, carbonfree ferrotitanium, cuprotitanium and manganotitanium) be tested for their usefulness as materials for prosthetic dentistry.

15, Boulevard des Philosophes, Geneva, Switzerland

Speech as related to dentistry

H. Harlan Bloomer. *J.Michigan D.A.* 40:258-267 Nov. 1958

Specialists in dentistry and speech correction can do much to improve their services to patients. Cooperation should extend into the fields of diagnosis, consultation, preventive speech correction and dental procedures.

Probably there is no simple, direct relationship between malocclusions and speech defects. The incidence of articulatory defects decreases with age almost continuously from the first through the twelfth grade, whereas the incidence of malocclusion has been asserted to remain relatively constant or possibly to increase during a similar period. However, in a particular individual a functional relationship may exist between defective speech articulation and malocclusion. A true relationship exists if the nature of the structural abnormality is such that it interferes with the regulation of any of the musculoskeletal valves involved in consonant articulation.

Malocclusion may influence speech either directly or indirectly. Indirect influences are exerted through the effect of this abnormality on the general health of the patient or on his personality (for example, through feelings of inferiority in response to his awareness of the poor appearance caused by malocclusion or ill-fitting dentures). Malocclusion influences speech directly when it interferes mechanically with the articulatory movements of the lips and tongue.

Articulatory disorders afflict about 5 per cent of the population, being of higher incidence in childhood and diminishing in frequency after eight or nine years of age.

Speech is an activity acquired by training which is dependent on the conditions of learning which a person has experienced, on his physical and emotional status and on his reactions to the environment. Speech defects reflect multiple causes rather than a single cause.

Among the conditions of the orofacial region which may contribute to defective speech are the following: extreme distoclusion, extreme mesioclusion, open bite, lingually malposed teeth (especially the anterior upper teeth), upper teeth in labioversion (especially when associated with distoclusion), asymmetry of the dental arches (especially of the maxillary arch), absence of teeth, extreme contraction of the maxillary arch, poorly adapted orthodontic or prosthetic appliances, labial deficiencies (especially a short, immobile upper lip), lingual deformities, astomia, nasal deformities, enlarged tonsils and adenoids, palatal defects, lingual and facial paralyses of peripheral or central origin, ankylosis of the temporomandibular joint, and micrognathia.

The dental specialist, speech pathologist and other specialists should work together in diagnosing and treating such problems. If the abnormal structures can be improved, this should be done; if not feasible, the patient may be taught adaptive functions to improve or correct his speech.

A qualified speech therapist can assist the dental practitioner by providing speech therapy for patients, and as a consultant regarding the nature of their speech problems. A directory of speech correctionists may be obtained from the American Speech and Hearing Association, 1001 Connecticut Avenue, N.W., Washington 6, D.C.

University of Michigan, Ann Arbor, Mich.

New equipment

The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

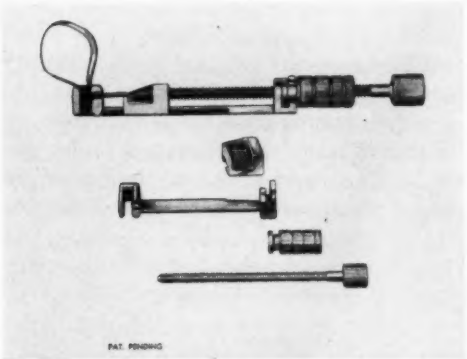
The "Glow-Box" is a new light box that can be used and stored in a standard desk drawer. The box is large enough to illuminate standard 8½ by 11 inch drawings. Also it can be used to compare and study x-ray films. It is useful as a portable light source in the office, laboratory and shop, wherever a source of diffused light is needed. Two spring clips hold the x-ray film in place at any angle. *Instruments for Research and Industry, 108 Franklin Ave., Cheltenham, Pa.*

The "Magna-Meter" is described as the first "universal" large capacity aerosol metering valve. It is usable with all types of available propellants, and is capable of dispensing eye and mouth sprays, vitamins, foods and other products in measured quantities of several cubic centimeters. The Magna-Meter can dispense foam, spray or liquid products in measured quantities ranging from 150 mg. up to 2,500 mg. *Risdon Manufacturing Co., Naugatuck, Conn.*

The "Dentalair," a high-speed, air-powered dental drill perfected in Sweden, now is available in the United States. The Dentalair offers speeds ranging from fewer than 500 rpm up into the high-speed range. With both straight and contra-angle handpieces, the unit uses conventional shank cutting instruments. *Parkell Co., 116 East 18th St., Long Island City, N. Y.*

"Supermix" dental x-ray developer and fixer are now available in rigid plastic bottles manufactured by Owens-Illinois Glass Co. Each container holds 26 ounces of liquid concentrate which will make one gallon of developing or fixing solution. The bottles have metal caps. *X-Ray Department, General Electric Co., 4855 West Electric Ave., Milwaukee 1, Wis.*

An improved "Toothmaster" universal matrix retainer holds any band width, either ribbon or precut, for any restoration or wax pattern. The band can be inserted in the retainer and adjusted to any tooth quickly. The finger-tip controls extend outside the patient's mouth for ease of adjustment. The retainer can be disassembled into its four component parts for cleaning. The retainer comes with 12 stainless steel reusable bands. *Toothmaster Co., 305 Hamilton St., Racine, Wis.*



Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

The problem of pocket formation in marginal periodontal disease (Zur Frage der Taschenbildung bei den marginalen Parodontopathien). *Peter Bertzbach. 1957.* DR.MED.DENT. *University of Mainz, Germany.*

The importance of mechanical preparation of the pulp chamber and the root canals (Importancia de la preparación mecánica de la cámara y de los conductos radiculares). *Dolly Gomez. 1958.* CIR. DENT. *Pontificia Universidad Católica Javeriana, Colombia.*

Study of the relation of the temporomandibular joint to dentomaxillofacial anomalies (Estudio de la articulación temporomaxilar en relación con las anomalías dento-maxilo-faciales). *Alba Guerrero, German Jaramillo and Arturo Pinto. 1957.* CIR. DENT. *Pontificia Universidad Católica Javeriana, Colombia.*

Ethics in dentistry (Síntesis deontológica en odontología). *Alvaro Martinex and R. D. Granados. 1957.* CIR.DENT. *Pontificia Universidad Católica Javeriana, Colombia.*

Treatment of the hypersensitive dentin (Terapéutica de la hiperestesia dentinal). *Laura Perilla and Nhora Ardila. 1958.* CIR.DENT. *Pontificia Universidad Católica Javeriana, Colombia.*

Roentgenographic study of the temporomandibular joint (Estudio radiográfico de la articulación témporo-mandibular). *I. A. Villegas, I. A. Ramirez and E. R. Ospina. 1958.* CIR.DENT. *Pontificia Universidad Católica Javeriana, Colombia.*

Selective grinding as a functional treatment in chronic marginal periodontal disease (Das auswählende Beschleifen als funktionelle Therapie bei den chronischen marginalen Zahnbetterkrankungen). *M. Daerfliger, 1957.* DR.MED.DENT. *West German Dental Clinic. Medical Academy of Düsseldorf, Germany.*

Proprietary preparations of dental filling materials (Fertigpräparate für die zahnärztliche Wurzelfüllung). *Jürgen Schmidt. 1957.* DR.MED.DENT. *University of Hamburg, Germany.*

Root canal disinfection during the last 30 years (Wurzelkanaldesinfektion in den letzten 30 Jahren). *Gerd Müller. 1957.* DR.MED.DENT. *University of Hamburg, Germany.*

Carcinomas of the maxillofacial region (Die Karzinome des Kiefer- und Gesichtsbereiches). *Dietrich Guhl. 1957.* DR.MED.DENT. *University of Hamburg, Germany.*

Sterilization of handpieces and angles with silicone oil (Die Sterilisation von Hand- und Winkelstücken mit Silikonöl). *Horst Bechtel, 1957.* DR. MED.DENT. *University of Halle/Saale, Germany.*

Etiology and pathogenesis of follicular cysts associated with impacted lower third molars (Über die Ätiologie und Pathogenese follikulärer Zysten an impaktierten Weisheitszähnen im Unterkiefer). *Irmgard Zielhoff. 1957.* DR.MED.DENT. *Medical Academy of Düsseldorf, Germany.*

Test methods used in odontogenic focal infection: diagnostic and therapeutic procedures made possible by the use of "Impletol," developed by Huneke (Über Testmethoden bei dentogener Fokalinfektion: Unter besonderer Berücksichtigung der diagnostisch-therapeutischen Massnahmen mit "Impletol" nach Huneke). *Dieter Willms. 1957.* DR.MED.DENT. *Medical Academy of Düsseldorf, Germany.*

Melkersson-Rosenthal syndrome: report of case (Ein Beitrag zum Melkersson-Rosenthal Syndrom). *Heinz Wilhelm Pelser. 1957.* DR.MED. DENT. *Medical Academy of Düsseldorf, Germany.*

Contents

Roentgenology

Groningen cephalostat. *Beek*. 3
Cineroentgenography. *Lindblom* 5
Cephalometric study of skulls. *Ceballos*. 5
Irradiation osteonecrosis. *Schröder*. 6
Effect of contrast mediums. *Pettinari*. 6

Oral surgery

Cleft palate feeding aid. *Roberts*. 7
Cysts of the jaw. *Pimenova*. 8
Treatment of oral cancer. *Bonse*. 8
Trigeminal neuralgia. *Heppner*. 9

Orthodontics

Muscular forces of tongue. *Kunváry*. 10
Age factor in orthodontics. *Fletcher*. 12

Operative dentistry

Preformed matrix bands. *Tocchini*. 13

Biochemistry

Problems of calcification. *Irving*. 14
Hard tooth substances. *Müller*. 14

Periodontics

New ultrasonic instruments. *Ewen*. 15
Mucoperiosteal flap healing. *Dedolph*. 16
Mycologic research. *Mugnier*. 17
A bacitracin dressing. *Baer*. 17
Recurrent gingivitis 18
Use of proteolytic enzymes. *Gaschler*. 18

Extractions

Cause of headaches. *Debernardi*. 19
Postextraction bacteremia. *Bender*. 19

Prosthetic dentistry

Pinless gold inlays. *de Boer*. 20
Bite registration. *Gade*. 21
Cobalt-chromium alloys. *Earnshaw*. 21
Adjustable acrylic post-dam. *Storer*. 21
Study of denture cleansers. *Anthony*. 22

Anesthesia and analgesia

Endotracheal anesthesia. *Pflüger*. 23
Local anesthetics: agents for injections. 25
Diabetic dental patients. 26

Histology

Pattern of mineralization. *Crabb*. 27
Viruslike mycotic organism. *Box*. 28
White carious spots. *Sharpenak*. 28
Histology of root canals. *Müller*. 29

Physiology

Human salivary glands. *Port*. 30
Muscles of mastication. *Marevskaya*. 30
Resorption of deciduous teeth. *Fischer*. 31
Sebaceous glands in lip. *Miles*. 31
Postoperative growth of jaw. *Tomek*. 32

Pathology

Osteomyelitis of jaw. *Skorobogatko*. 33
Retrocalcaneal bursitis. *Steffensen*. 33
Oral carcinomas. *Šveda*. 34
Trismus hystericus. *Sellach*. 34
Maxillofacial cylindroma. *Mehnert*. 35

Pain in the tongue.....35
Fibroma symmetrica gingivalis. *Olvén*.....35
Candidiasis. *Giunchi*.....36
Melanoma of palate. *Hales*.....37
Allergy and the dentist. *Magnusson*.....37
Congenital hematoporphyria. *Stick*.....38
Psoriasis of the mouth. *Leaver*.....38
Dental caries in animals. *Rudinu*.....38
Dentinogenesis imperfecta. *Jahn*.....39
Dormant cancer cells. *Dontenwill*.....40
Secondary hyperparathyroidism. *Domeck*....40
Sarcomas of soft tissues. *Betzler*.....41
Black hairy tongue. *Mathis*.....41
Rubella and dental defects. *Grahnén*.....42
Enamel defects. *Grahnén*.....42
Canker sores. *Scott*.....43
Herpes zoster. *Oksala*.....44
Facial hemiatrophy. *Pathania*.....44

Public health dentistry

Fluoride study in Russia. *Zemlyanitskaya*....45
Trace elements and caries. *Kruger*.....45
Experimental caries. *Steinman*.....45
Stannous and sodium fluorides. *Gray*.....46
Czech school dental service. *Svejda*.....47
Strontium in teeth. *Steadman*.....47
Freedom from caries. *Sullivan*.....48
Lactobacilli study in Italy. *Baird-Parker*.....48
Diets of Central Americans. *Flores*.....49
Sweet tooth and decay.....49
Chocolate and dental caries. *Mueller*.....50
Caries in Czech children. *Miksa*.....50
Oral health in Kansas City. *Wells*.....51
Oral hygiene of dentists. *Slack*.....51
Streptococcus salivarius. *Cohen*.....52
Texture of confectionery. *Stocker*.....52

Therapeutics

Sjögren's syndrome. *Gurling*.....53
Use of vitamin B_{12}. *Bozzini*.....53
Nitrofurazone in dentistry. *Berger*.....54

General

Paintings of Solot. *Meilach*.....55
Abuse of advertising. *Fonterrada*.....56
Types of specifications. *Docking*.....57
New prosthetic material. *Barnhart*.....57
Dentist in Antarctica. *Knoedler*.....58
Titanium and its alloys. *Nicolas*.....58
Speech and dentistry. *Bloomer*.....59

New equipment

Equipment news.....60

Doctoral and Masters' dissertations

Dissertations.....61

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Index of authors

Anthony, David H. 22

Baccaglini, M. 6
Baer, Paul N. 17
Baird-Parker, A. C. 48
Barnhart, George W. 57
Beek, J. M. 3
Bender, I. B. 19
Berger, Ulrich 54
Betzler, H. J. 41
Bisset, K. A. 48
Bloomer, H. Harlan 59
Bonse, G. 8
Box, Robert M. 28
Bozzini, Carlos E. 53
Broge, Robert W. 46
Bruce-Pearson, R. S. 53
Brudevold, Finn 47

Carter, Wm. J. 51
Castiglioni, G. C. 6
Ceballos, Jorge L. 5
Clark, Henry B., Jr. 16
Coe, George H. 51
Cohen, Alan H. 52
Collins, Albert A. 52
Copeland, John 51
Crabb, H. S. M. 27
Crawford, M. N. 43

Debernardi, G. 19
de Boer, J. G. 20
Dedolph, T. H., Jr. 16
Docking, A. R. 57
Domeck, R. 40
Dontenwill, W. 40

Earnshaw, R. 21
Evensen, A. 33
Ewen, Sol J. 15

Fischer, Guido 31
Fletcher, G. G. T. 12
Flores, Marina 49
Fonterrada V., D. 56

Gade, Ejnar 21
Garobotte, R. C. 40
Gaschler, Adolf 18
Gibbons, Paul 22
Giunchi, Giuseppe 36
Goldman, Henry M. 17
Grahnén, Hans 42
Gray, John A. 46
Guleria, J. S. 44
Gurling, K. J. 53

Hales, W. B. 37
Halpern, J. 40
Hardinge, Mervyn G. 45
Haynes, Sidney 51
Hejman, D. 40
Heppner, Fritz 9

Irving, J. T. 14

Jahn, E. 39

Knoedler, David 58
Kruger, B. J. 45
Kruse, Helmut 41
Kunváry, Bella 10

Larsson, P. G. 42
Leaver, Robert 38
Lindblom, G. 5

Magnusson, Bertil 37
Magud, E. A. 28
Marevskaya, A. P. 30
Mathis, Hermann 41
Mehnert, Herbert 35
Meilach, Dona Z. 55
Michael, E. 40
Miksa, J. 50
Miles, A. E. W. 31
Mueller, William S. 50
Mugnier, A. 17
Müller, Walther 14, 29

Nicolas, Georges 58
Nikolaev, N. V. 28

Oksala, O. 44
Olvén, Sölve 35

Pathania, Nasib Singh 44
Pettinari, V. 6
Pflüger, H. 23
Pike, E. B. 48
Pimenova, A. M. 8
Pond, M. H. 53
Ponková, V. 47
Port, Th. 30
Pressman, R. S. 19

Rentschler, E. H. 5
Roberts, A. C. 7
Robinson, John E. 57
Rosemblit, E. 40
Rosevear, Francis B. 46
Rudinu, Ivaldo 38

Schröder, Friedrich 6
Schweizer, Henry C. 46
Scigliano, John 17
Scott, T. F. McNair 43
Sellach, Joachim 34
Sharpenak, A. E. 28
Skorobogatko, V. Z. 33
Slack, Geoffrey L. 51
Smith, Frank A. 47
Stahle, Jan 35
Stanmeyer, William 58
Steadman, Luville T. 47
Steffensen, J. C. A. 33
Steinman, Ralph R. 45
Stick, W. 38
Stocker, R. B. D. 52
Storer, Roy 21
Sullivan, H. R. 48
Svejda, J. 47
Šveda, Josef 34

Tascher, Paul J. 15
Tashman, Sylvia G. 19
Tocchini, John 13
Tomek, S. 32

van der Linden, F. P. 3

Wells, Jack E. 51
Winckler, J. 40
Woods, Robert W. 45

Zemlyanitskaya, E. T. 45
Zellner, R. 39

Contributing Abstracters

Finnish, Russian

Barbara Kessler, M.D.
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